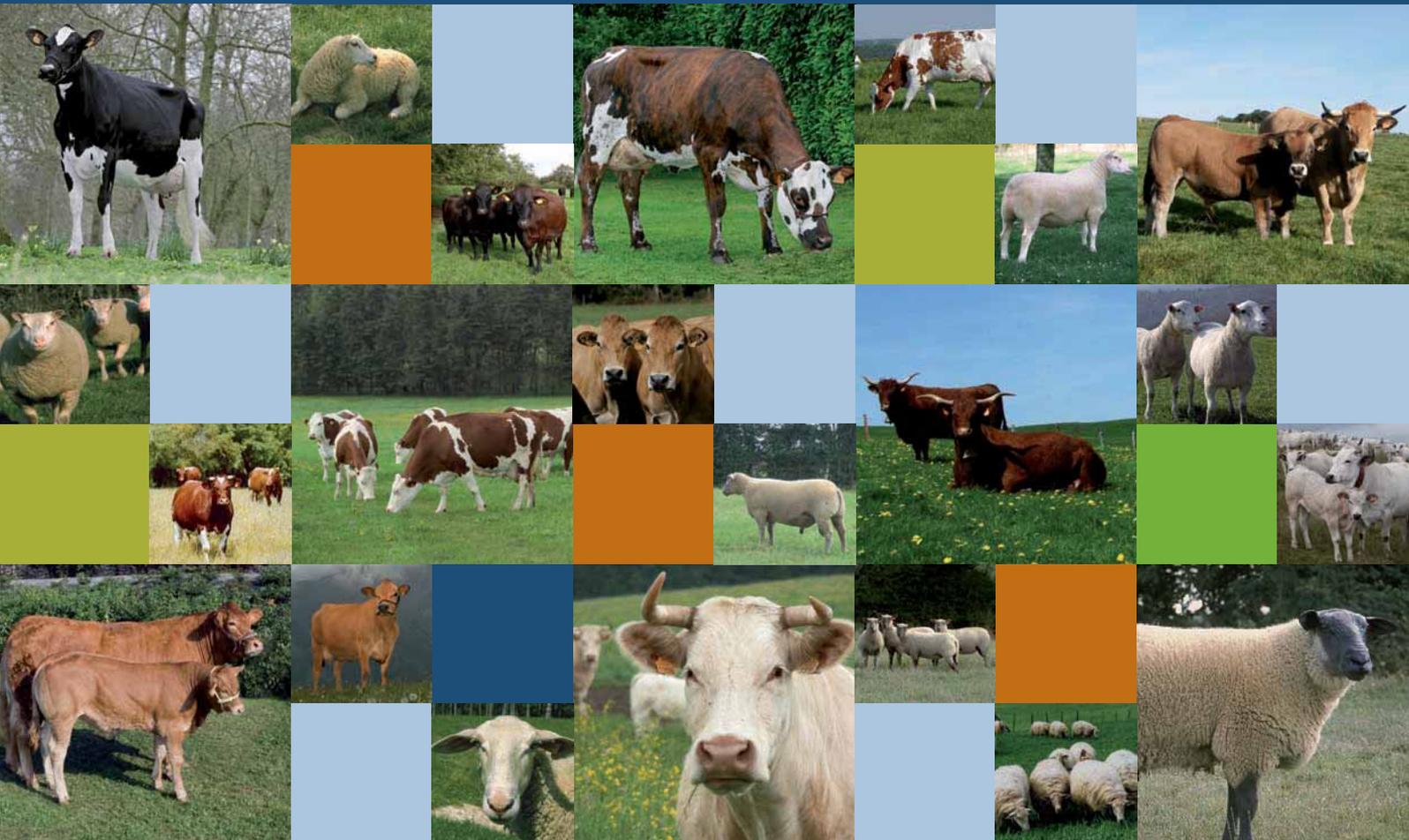


# French genetics for cattle, sheep and goat industries

QUALITY - INNOVATION - PERFORMANCE





**To download the file of brochure and find all additional information about French genetics for cattle, sheep and goat industries : [www.france-genetique-elevage.org](http://www.france-genetique-elevage.org)**

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Financial support: Centre National de Promotion des Produits Agricoles et Alimentaires, FranceAgriMer, France Génétique Elevage et Ministère de l'Agriculture / ADEPTA.

Graphic design - PAO: Bêta Pictoris

# Breeds and farmers for the best of cattle, sheep and goat genetics



“

The cattle, sheep and goats farming have an important place in French agriculture, which together with food industries, constitutes the first national economic sector. European leader in the sector, France is also ranking among the world's leading producers of milk, meat and cheese thanks to the productivity of its farms, the quality of its products and the dynamism of its industries.

These results can be explained primarily by the remarkable richness of its genetic heritage, with more than 70 breeds of cattle, sheep and goats. This biodiversity provides a wide range of zootechnical traits, real asset to respond to the diversity of farmers' objectives, production conditions and expectations of food chains.

This place of France among the world leaders is also made possible by the continuous genetic improvement of these breeds. Thanks to the know-how of its farmers and the expertise available within of their technical organizations, they benefit from modern and efficient selection programs.

Since 1966 and based on a unique official individual animal identification, a very large on-farm data performance recording system and evaluation by progeny testing, these breeding programs have benefited during 45 years from all scientific advances and technological innovations.

With controlled breeding populations among the largest in the world, the organization and rigor of these programs generate high-pace regular genetic progress for both high potential specialized breeds and hardy breeds.

Their worldwide distribution is a recognition of their quality, but also of the results achieved through the joint efforts of French farmers and their organizations, grouped under France Genétique Elevage umbrella.

Thanks to outstanding sanitary safety nets, many farmers worldwide have been long appreciating these breeds and continue to do so for they secure the competitiveness of their farms, the reputation of their products and the satisfaction of the consumer.

”

Dominique Davy - President of France Genétique Elevage



DR

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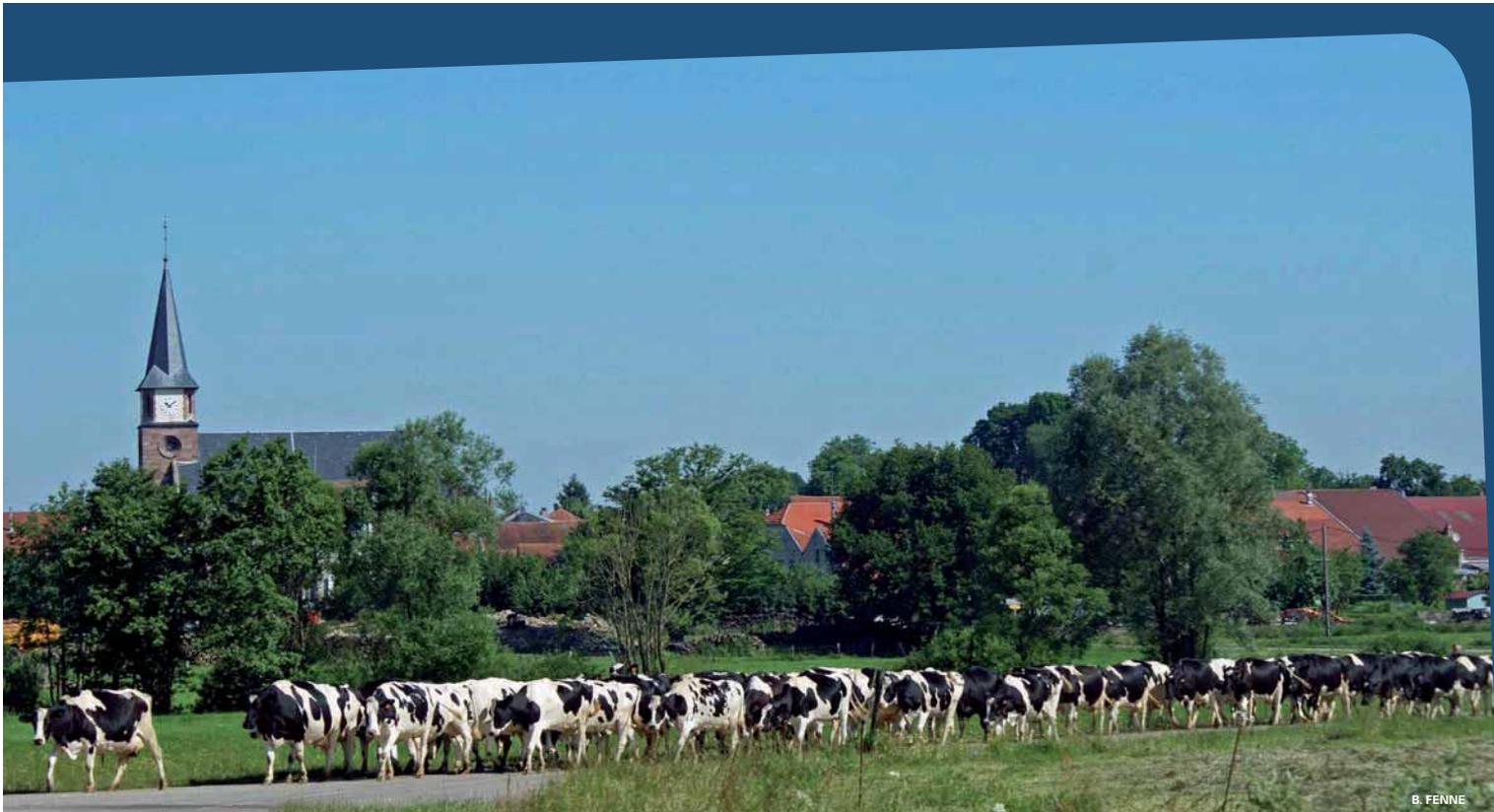
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B. FENNE

**FRENCH LIVESTOCK SECTOR**

# France, a livestock country

Agriculture, along with the food and farming industry, is the leading sector of the French economy. Half of French farmland is devoted to cattle, sheep and goat farming.

Europe's leading agricultural power, France also ranks among the leading producers of milk and meat worldwide, carried by the productivity of French farming and its dynamically competitive sub-sectors.

**1**

## Leading sector of the French economy

France counts 490,000 farms which, with 29 million hectares, cover 53% of the French mainland. **Agrifood industry along with Agriculture is the leading sector of the French economy**, with a turnover of €212 billion (2012), beating other sectors such as aerospace or the automobile industry.

The 146,000 km<sup>2</sup> of land (permanent pasture or fodder crops) devoted to cattle, sheep and goat farming accounts for half of all farmland in France.



G. Friedrich

Animal products, 2/3 of which is beef and milk, accounts for 36% of the nation's output from farming. The beef and dairy industries account for 38% of national agrifood industry turnover.

**THE CATTLE, SHEEP AND GOAT FARMING IN FRANCE**

- 49% of utilized agricultural area
- 200,000 cattle farmers
- 63,000 sheep and/or goat farmers
- 19 million head of cattle
- 8.8 million head of sheep and goats



## 2

### Ranking first in the European Union

France is Europe's biggest agricultural producer, contributing 19% of EU agricultural output. French farms average 55 ha of land, which is four-fold higher than the all-Europe average.

French livestock represents a dominant share of EU 27 animal production. At 19 million head of cattle (including 7.7 million cows), the French national herd alone – the biggest in EU 27 – accounts for almost a quarter of the entire all-Europe headcount.

More than just the biggest, this national herd is also the most diversified. Co-farming two specialized herds of very-large-format animals – one for dairy production, the other for beef production – is a specifically French development, as dairy herds dominate in most of the other livestock farming countries in Europe.



At a total 11 million head of cattle (including 4 million cows), the French national beef-breed herd is the biggest in all EU 27, accounting for almost a quarter of the entire all-Europe headcount. France is the leading producer of beef and veal in the EU, at 1.5 million tonnes–carcass weight equivalent (tCWE) in 2012.

The productivity of French breeds has carried France to a position as third-biggest producer of sheep meat in Europe, at 101,000 tCWE (2012), despite the fact that the national count of 7.5 million head (including 5.7 million ewes) only ranks 3th in EU 27.

With a national dairy herd of 3.6 million cows, France is the EU's second-biggest producer of cow's milk (24 million tonnes, or around 17% of all EU 27 output).

The productivity of its 1.6 million dairy ewes and 1.2 dairy goats has propelled France to a position as Europe's leading producer of goat's milk (500 million litres) and fourth-biggest producer of ewe's milk (260 million litres). All product sectors included, France ranks as Europe's second-biggest producer of cheese, at 1.9 million tonnes in 2011.

#### FRENCH LIVESTOCK AT EUROPEAN SCALE

- 1st agricultural producer
- 1st national cattle herd
- 1st producer of beef
- 1st producer of goat's milk
- 2nd producer of cow's milk
- 2nd producer of cheese
- 3th producer of lamb meat

3

## Among the world leaders

French agriculture is an economy-leading sector not just in France but worldwide. For over 20 years, France has ranked among the world's top 3 exporters of farming and agrifood products, with 2012 figures putting trade at a total value of €57 billion.

France is also continuing to consolidate its position among the world's leading cattle farming producers. France is the world's fourth-biggest exporter of dairy products in terms of value traded (€6.6 billion in 2012), with cheeses leading the way (€2.8 billion). **France ranks as the world's fifth-biggest producer of cow's milk, at close to 24.2 million tonnes in 2010**, behind far more vast countries like the USA, India or China.

France also ranks as the world's second-biggest exporter of grazer calves (around 1 million animals per year) and the world's seventh-largest producer of beef.



### A LIVESTOCK SECTOR BASED ON FAMILY FARMS

Unlike other major livestock countries among which France is ranking, French livestock farming sector is almost exclusively based on family farms, sometimes with an employee.

Concerning the dairy sector, the national average milk per farm stands around 340,000 litres, with around one in four farms producing over 500,000 litres a year. Looking at the wider picture, French dairy farms sector appear less concentrated compared to other EU Member States, notably in Northern Europe (630,000 litres/farm/p.a. in the UK, 1 million litres/farm/p.a. in the Netherlands, and even up to 1,2 million litres/farm/p.a. in Denmark).

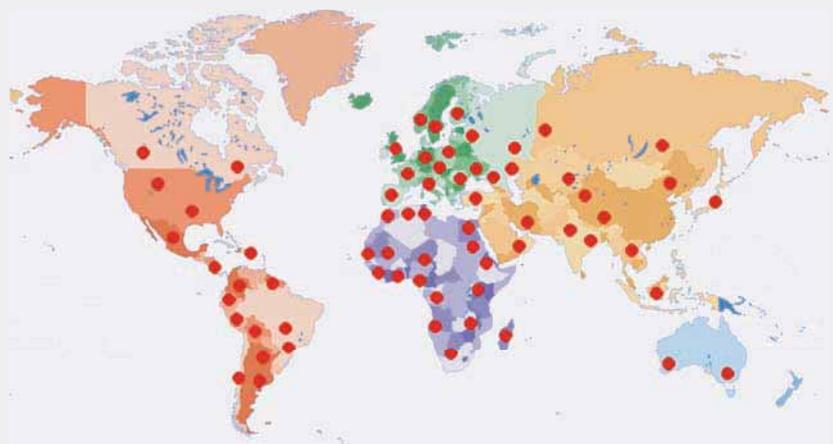
As with the other cattle, sheep and goat dairy productions, this France-specific configuration has been shaped by government and farmers' organizations for 40 years: facilitating the development of family and human-scale farms and allowing young dairy farmers to start up new businesses across the territory, even in difficult and disadvantaged areas.

Given the diversity and productivity of French breeds, adapted to a very broad range of production conditions and farming objectives, such a strategic orientation places livestock farming at the centre of spatial planning and rural development policy.



Year after year, France holds onto its position as one of the world's leading exporters of genetic stock for the cattle, sheep and goat farming sectors, with almost 2.8 million semen doses and 55,000 stud animals going out to the export market.

### FRENCH GENETICS : EXPORTED WORLDWIDE



### FRENCH LIVESTOCK AT WORLDWIDE SCALE

- 2nd exporter of weanlings
- 4th exporter of dairy products (in value traded)
- 7th producer of milk
- 7th producer of beef meat
- 2.8 million semen doses to the export market
- 55,000 cattle, sheep and goat stud animals to the export market



HB CHAROLAIS

**FRENCH LIVESTOCK SECTOR**

# A remarkable genetic heritage

France hosts a great variety of native ruminant livestock breeds. This broad panel of breeds offers a source of biodiversity featuring outstanding zootechnical traits.

This natural heritage is a major asset for meeting the broad-ranging needs of livestock farmers in France and worldwide, according to their production conditions and the expectations of their agri food industries.

**1**

## French regional diversity and genetic biodiversity

The genetic diversity found in French livestock is a reflection of the diversity in France's myriad local regions. The traits of French breeds have been forged by a long-standing selection tradition, and are intimately tied to the sum of effects of the local environment in which they have been created and developed, ultimately becoming world-renowned phenotypes.

These different environmental conditions, combined with successive waves of political and economic history (British influences in the north, central-European in the east, and Mediterranean across the south) - all materialized through the efforts of livestock breeders - have naturally and progressively forged the remarkable biodiversity of the French national herd stocks.



On the westernmost side of Europe, France hosts the end of the great European Plain in the north-west, while at the same time bordering the Alpine ranges in the south-east.

France also features two even older, heavily eroded upland massifs cleaved with valleys - Brittany and, of course, the Massif Central - that boundary coastal plains or lowland ranges (Aquitaine, the Midi-Pyrénées and the Languedoc).

This configuration naturally gives way to a variety of different soils and landforms, from the mountainous heights of the Alps and the Pyrenees to the limestone plateaus called Causses, and the low-lying plains of the Paris basin to the valleys of the Charolais hills...

This diversity is compounded by a variety of different climate zones. The ocean climate lends the coastal regions a temperate climate with plenty of rain creating ideal conditions for forage and croplands. South-western France (Aquitaine) is conducive to a broad variety of farmed produce, whereas south-eastern France is pure Mediterranean.

The Alps and Pyrenees, as younger mountain ranges, are characterized by deep-set boxed-in valleys and high-altitude summer pastureland rising in stages from 1,600 to 2,500 metres asl.

The plateaux and upland ranges of eastern France enjoy a more continental climate, where the lowland areas are mainly used for cropland while forage production (essentially grass) takes over as soon as the land begins to climb (Jura).

2

## Dairy cattle breeds



The need to intensify production prompted the French coastal regions, much of the adjacent hillsides, and certain of the gentler mountain regions (the Jura, Eastern Massif Central) to turn towards specialized dairying breeds. These are the zones where the **Holstein**, and the **Montbeliard** in eastern France, now predominate, yielding exceptionally high dairy output figures.

The dairy breeds also feature a range of niche breeds that count only limited herd numbers as they have suffered from competition from more productive breeds. However, here again, herd numbers have generally been put back on track thanks to efforts made under specially-adapted conservation programmes: **Bordelaise**, **Bretonne Pie Noir**, **Ferrandaïse**, **Froment du Léon**, **Villard de Lans**...



The **Normande** breed, which was developed in a pasture-rich region of north-western France, combines equally remarkable dairying performances - both quantitatively, in terms of lactation levels, and qualitatively, with its content-rich milk - with sought-after carcass merit traits.

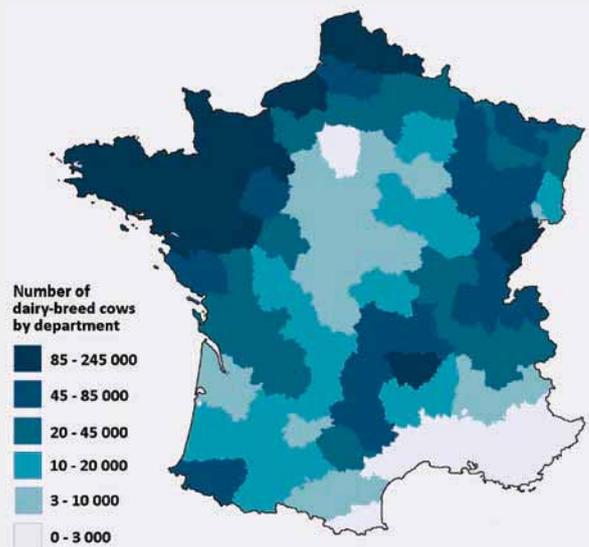
Furthermore, in each region, generation after generation of livestock farmers have forged other local herds to meet their needs, thereby creating breeds well adapted to their individual home regions, that would then be constantly improved and subsequently spread outwards into other regions and territories.

Standout examples of large-framed high milk-producing breeds include the **Pie Rouge** in western France and the **Brown Swiss** in central-to-eastern France.

Two smaller-framed breeds from the northern Alps - the **Abondance** and the **Tarentaise** - also stand out due to the way they have been adapted to tough farming conditions: low maintenance needs, ability to exploit rough forage, ability to cope with extreme weather.

Under conditions like these, they are hardy enough to yield a more-than-acceptable output of milk that French markets use to make top-quality cheeses.

SPATIAL DISTRIBUTION OF DAIRY-BREED COWS IN FRANCE



Source : national database of animal identification / Institut de l'Elevage

### DAIRY CATTLE BREEDS

- 8.3 million dairy cattle
- 3.6 million dairy cows
- 76,000 dairy cattle farmers
- Dairy national production of 24 million tonnes
- 12 dairy breeds under genetics selection program
- 5 dairy breeds under genetics conservation program



3

**Beef cattle breeds**

The French national herd stock had earned worldwide renown for the quality of its beef breeds, **Charolais**, **Limousin** and **Blonde d'Aquitaine**.

These former draught breeds native to the grassland ranges of central France have successfully been transitioned into specialized beefers that muscle and grow fast and yield excellent carcass quality.

All three breeds, which were originally developed in the north-eastern Massif Central (Charolais), its western borders (Limousin) and the hills and valleys of south-western France (Blonde d'Aquitaine), are expanding fast across France and around the world. They are very popular in all the major livestock farming countries across the world, due to the fast-muscling growth they offer, whether used as purebreds or for crossbreeding.

However, there are other large-frame breeds that are equally specialized beef producers. Offering heavy-yield carcasses and excellent carcass conformation, these high-performance breeds are winning over an increasing number of breeders due to their carcass merit traits: they include the **Rouge des Prés** (formerly 'Maine-Anjou'), the **Parthenais** and the **Bazadais**.

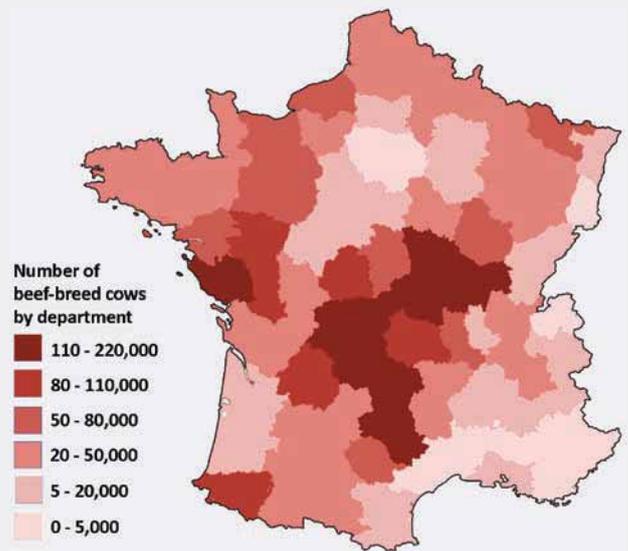
Originating in the Massif Central (**Salers**, **Aubrac**) and Pyrenees (**Gascon**) regions noted for their rougher rocky terrains and harsher climates, these breeds have proven particularly well adapted to areas where conditions for beef production are tough (rough forage, extreme variations in temperature, topography...).



Thanks to their maternal traits (fertility, ease of calving, suckling and nursing ability, longevity...) without losing their carcass merit, these breeds give good results in purebred herds, as they are able to sire robust veal calves with relatively little investment input. However, they are equally profitable when crossbred with bulls from high- and fast-muscling breeds, particularly the Charolais. The resulting crossbred grazer calves are very popular among French and foreign fatteners.

Again, as with the dairy breeds, France also composes with niche beef breeds that count only limited herd numbers but that are being managed under special-purpose conservation programmes: **Armorican**, **Béarnais**, **Casta**, **Lourdais**, **Maraichine**, **Mirandaise**, **Nantais**, and **Saonoise**, among others.

SPATIAL DISTRIBUTION OF BEEF-BREED COWS IN FRANCE



Source : national database of animal identification / Institut de l'Elevage

**BEEF CATTLE BREEDS**

- 11 million beef cattle
- 4 million beef-breed cows
- 98,000 beef cattle farmers
- Beef meat national production of 1.5 million tCWE
- 9 beef breeds under selection programs
- 8 beef breeds under conservation programs

4

## Meat sheep breeds

The last few decades have witnessed major shifts in the land map and composition of the French national sheep flock. The progressive abandonment of ewe-plus-cereal crop systems by farms in the Paris Basin has redrawn the distribution of the nation's flocks, which are now clustered in the grassland regions of central and western France and the tougher, more rugged zones of the southern half of the country.



Under intensive flock management systems led in cereal-crop areas, early-maturing breeds that produce heavy lambs, like the **Ile de France** and the **Berrichon du Cher**, offer excellent perspectives for squeezing added value from cereals by finishing in the sheepfold.

Their out-of-season breeding ability also unlocks possibilities for running different lambing systems (1 or 2 lambing intervals) in order to best gear offer to market demand.

Under semi-extensive systems in the grasslands zones of good forage potential spanning central-western France, breeds like the **Vendéen**, the **Texel**, **Charollais**, **Rouge de l'Ouest** and **Charmoise** can be efficiently managed as unweaned grass-fed lambs. The possibilities for finishing the lambs on grass or in the sheepfold, allied with the ability to exploit early-lambing ability mean that flock management systems can be flexibly remodelled to meet each livestock breeder's objectives, notably to develop highly-profitable out-of-season production.

In the south of France, a dozen breeds offer the hardiness and maternal traits needed to ensure sheep farming can remain competitive despite the rugged production conditions (climate, topography, nutrient-poor forage): the **Limousine** (Haut-Limousin), **Rava and Bizet** (Auvergne), **Causses du Lot**, **Blanche du Massif Central** and the **Meat Lacaune** (Lozère), the **Grivette**, the **Préalpes du Sud** and the **Tarasconnais** (Pyrenees).

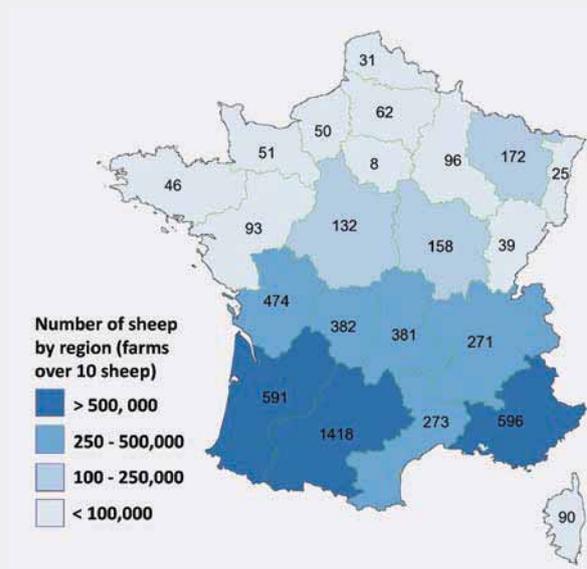
### MEAT SHEEP BREEDS

- 4.1 million meat-breed ewes
- 50,450 meat sheep farmers
- Lamb meat national production of 101,000 tCWE
- 8 specialized meat sheep breeds under selection programmes
- 15 hardy meat sheep breeds under selection programmes
- 1 highly-prolific breed under a selection programme

### DAIRY SHEEP BREEDS

- 1.6 million dairy-breed ewes
- 5,500 dairy sheep farmers
- sheep milk national production of 253 million liters
- 4 specialized dairy sheep breeds under selection programmes

## SPATIAL DISTRIBUTION OF EWES IN FRANCE



Source : ASP / Institut de l'Élevage

5

## Dairy sheep breeds

The **Lacaune** breed, which is native to the Massif Central, was selected to specialize as a dairy breed in the early 20th century, and has now become the most widely-used and highest-yielding dairying breed in France. One of the factors driving this development was that its milk can be used to produce the renowned Roquefort cheese, which first gained official recognition for its quality and authentic roots back in 1925 with the very first French Appellation d'Origine Contrôlée (AOC; controlled designation of origin).

The **Red-face Manech**, **Black-face Manech** and **Basco-Béarnais** from the western Pyrenees are generally raised and bred in foothills and upland mountain areas. All three are low-maintenance, easy-milking breeds well adapted to strong temperature variations.

The **Corsican** dairying ewe, whose population remains primarily limited to its native island, stands out as a particularly hardy breed that is able to draw on its energy reserves when food becomes scarce. It can easily be bred in total free-range systems in arid and transhumance path areas.



OS LACAUNE

6

## Dairy goat breeds



In France, goat breeding has been revolutionized over the last fifty years as the entire sector has been redeveloped, restructured and modernized, transforming what was once just part of self-sufficiency farming into a profitable and competitive industry. Intensive national-scale genetic improvement has enabled a constant increase in production volumes despite the substantial drop in nation-wide herd numbers.

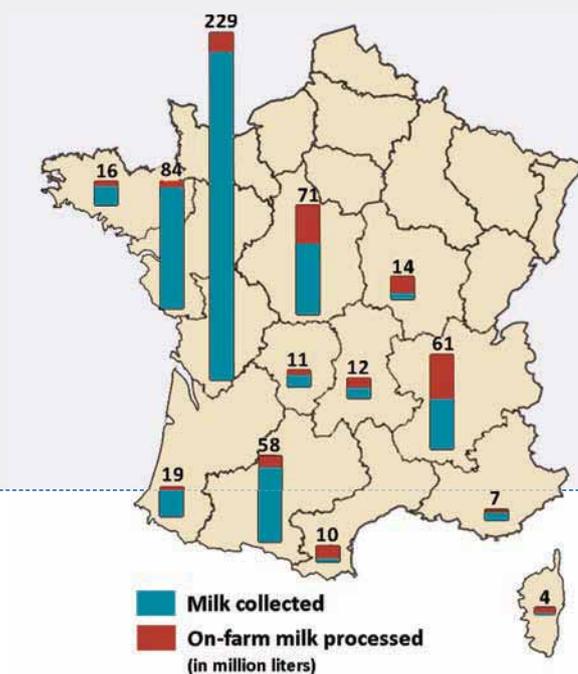
French goat farming, carried by an exclusively dairy-focused specialization along with rigorous and efficient selection programmes, has carved out its own unique position in the worldwide marketplace.

French goat herds are primarily composed of the **Alpine** breed (from the Alps) and the **Saanen** breed (named after its native Saanen valley in Switzerland), and they post outstandingly high milk-yield figures. Almost two thirds of the French herd is clustered in the centre-west (the Centre and Poitou-Charentes regions) and south-east (the Rhône-Alpes region) of the country.

However, livestock keepers continue to farm other more minor breeds. The Corsican goat breed has remained strong in its native island, as it is ideally adapted to farming conditions in its native maquis environment (tough, dense, thorny scrubland) and its milk is used to produce high-value AOC Brocciu cheese.

The **Poitou, Rove** and **des Fossés** breeds had been practically wiped out during the second half of the 20th century in the wake of epizootic disease, rural exodus, and competition from more productive breeds. However, their numbers have stabilized or even increased over the last decade thanks to specially-adapted conservation programmes.

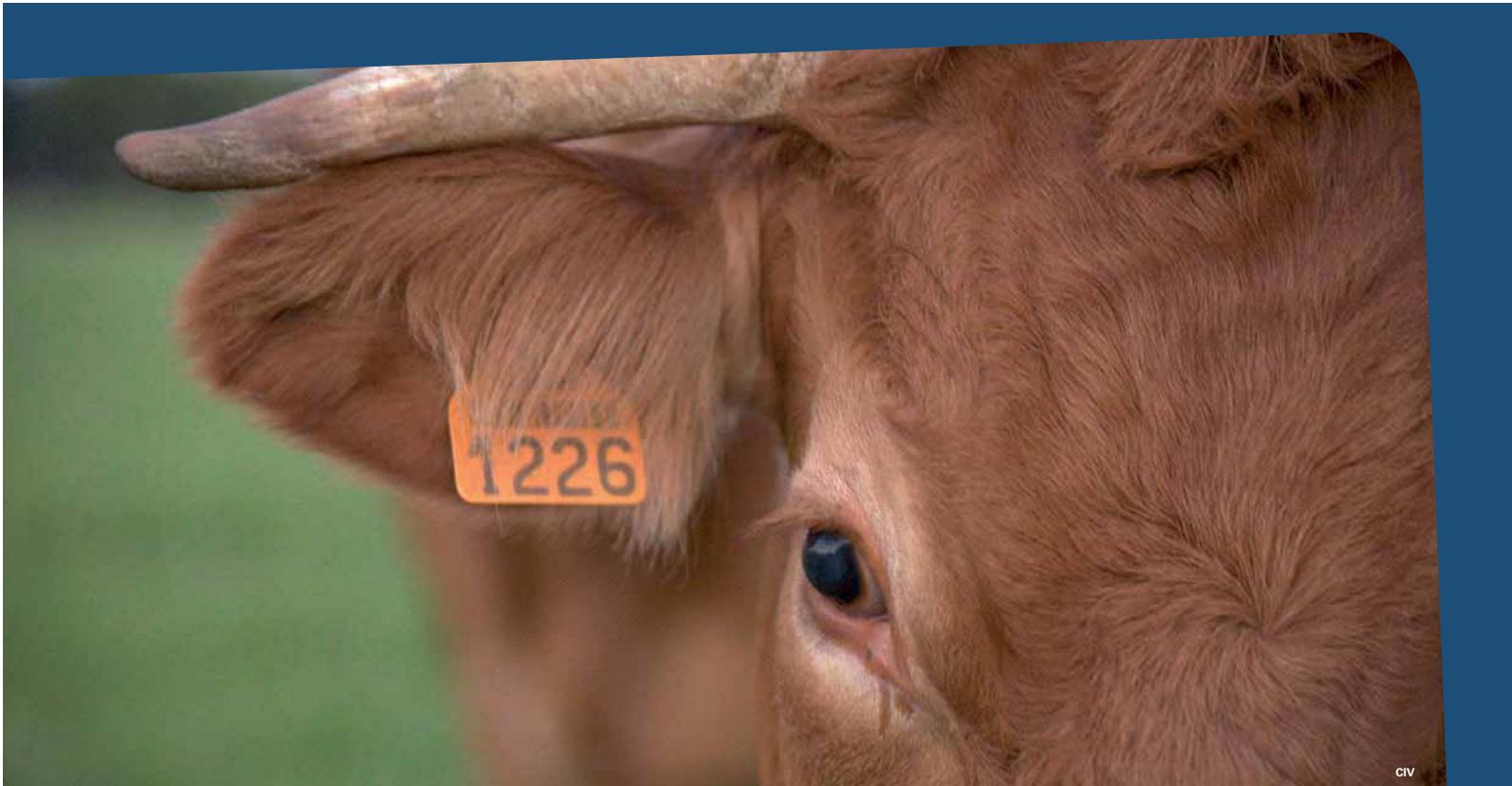
### SPATIAL DISTRIBUTION OF SHEEP MILK PRODUCTION IN FRANCE



Source : SSP annual agricultural statistics

#### DAIRY GOAT BREEDS

- 940,000 dairy goats
- 5,000 dairy goat farmers
- Goat milk national production of 657 million liters
- 2 specialized dairy goat breeds under selection programmes
- 5 dairy goat breeds under conservation programmes



civ

## FRENCH LIVESTOCK SECTOR

# Efficient national systems of animal identification and traceability

As well as enabling monitoring on animal health and traceability on animal end-products, the French animal ID system is also the first link in the cattle, sheep and goat genetic information systems chain.

The 40 years of French experience in developing animal ID/traceability and information systems has helped forge the quality and reliability of French genetic selection programmes.

1

## A system launched in 1969 then generalized from 1978...



civ

Identifying individual livestock has been a long-standing concern in France. Already back in 1969, the first ID system was launched to provide a rigorous organizational framework governing cattle breed selection programmes.

Starting out in 1978, France was a pioneer as the first country in the world to generalize individual

### 40 YEARS EXPERIENCE

- 1969 : individual cattle identification is introduced
- 1978 : individual cattle identification is generalized
- 1998 : full farm-to-fork traceability on all cattle-derived products
- 2009 : electronic cattle ID tagging on an opt-in basis
- 2010 : generalization of electronic ID tagging for sheep and goats

tagging and then make the transition to full compulsory traceability on all cattle. Since then, every bull and cow in the country has its own unique ID number (issued at birth, and which stays with the animal throughout its life) and its own passport, which is a compulsory document each time the animal needs to be moved.

This national animal ID system is completed by an ID system that tracks all farms the animal is housed on and then every premises through which it passes (collection centres, markets, slaughterhouses, etc.) by recording all movements and veterinary health data for each bovine - **in the process creating what was an unprecedented individual animal health traceability system in the 1980s.**

This system provided the efficient backbone to the French national herd disease prevention and epidemiological surveillance system, and was a step ahead of the subsequent OIE (World Organization for Animal Health) and WHO (World Health Organization) guidelines.



2

### ... and adapted to the evolving needs of industries

Since 1978, the French animal ID and traceability system has made great strides by integrating technological innovations and re-adapting to the changing needs of the cattle sector. Many features built from this long-standing experience have served to template a series of EU regulations (EC 1760/2000, EC 1825/2000) as well as various national EU member State schemes.



This exemplary system has made it possible to meet new consumer needs, by enabling food traceability (on meat, milk and processed end-products) from 'farm to fork'. The most striking illustration has to be full shelf-pack meat

labelling in retail outlets, which was ushered in by France in 1996 and gained EC recognition in 1998.

3

### Data recordings straight from birth

Farmers have up to 21 days from the calf's birth to uniquely identify each new calf by fitting approved tags in each ear. Each tag carries the animals own unique ID number, composed of the country code ("FR" for France) and a 10-digit code number.

Double tagging the animals is simply an additional security mechanism in place so that if an animal loses one of its ear tags, it is still identified by the second one. Any lost ear tag will need to be replaced with a new tag reprinted with the same ID number. Since 2010, breeders can opt to upgrade one of these two sight tags to an electronic ID ear tag fitted with a transponder.

The farmer has one week after ID-tagging their animal in which to provide the national computerized information database [the 'BDNI'] with the compulsory set of animal data, which they can do either via internet or by sending in a certified form: ID number, date of birth, farm herd number, the calf's mother's number, breed of the calf and of its mother and parent bull, and so on.



Once this information has been quality-controlled and recorded in the BDNI database, the animal can be issued with its own individual passport, which is sent out to the farmer and which must stay with the animal for all its entire life up to the slaughterhouse.

In addition to this animal identification information, the passport also carries with it the animal's veterinary health certificate (the 'ASDA'), which is issued by the veterinary authorities once the farm's veterinary health status has been checked. Barcoding the ear tags enables quick and easy sight checks of the animal's ID and farm herd number. The back of the passport details the animal's certified pedigree and parentage, and the identity of its successive owners.



#### PRINCIPLES THAT ALSO EXTEND TO SHEEP AND GOATS

Identifying sheep and goats – like cattle – has also been a long-standing concern in France, and has developed under the same framework based on animal and owner farm identification, data recording, compiling up-to-date farm registries, etc.

The French national system was first revamped in 1997, and since 2005 it has undergone a progressive yet deep-reaching overhaul with the implementation of European Council regulation (EC) 21/2004. Working to the same individual-animal traceability objective as for cattle, the French sheep and goat ID system is also built on double-tagging, an on-farm holding register for every livestock holder, movements traced by logging individual animal code numbers in a movement document, information recordings in a national computerized database, and so on.

However, the conditions governing how the system is applied have been adapted to accommodate factors specific to sheep and goat farming. One of these factors is the generalized implementation of electronic animal ID: one of the two ear tags has to be fitted with a transponder enabling a transceiver to read the animal's ID number.

4

## Full end-to-end traceability right up to the consumer's table

From this point on, each successive owner of the animal is legally required to notify the BDNI within 7 days each time the animal is moved (move-ins, move-outs, and to slaughterhouse).

Anyone who has cattle in their possession (livestock keeper, animal market, traders, slaughterhouse, etc.) is legally required to update a registry that logs the animal's every movement (births, move-ins, move-outs, and death). The path of every single cow is therefore tightly tracked from day 1 of its life.

At slaughter and then end-to-end through the distribution and consumer sales channel, each carcass and each cut of meat continues to stay identified, under French veterinary authority control.

This traceability system not only helps guarantee food health and safety but also provides consumers with assurances on the reliability of the compulsory labelling info given every single piece of beef on sale: its origin (country of birth, plus where farmed and where slaughtered), animal category (calf, heifer, bull, cow...) and breed type (beef breed or dairy breed).



For those distribution circuits that choose to opt in, the French traceability system can even stamp each carcass and label each piece of meat with the source animal's identification number and 'home' farm.

### OVER 270,000 ACTORS RECORDING INFORMATION

- 200,000 cattle farmers
- 63,000 sheep and/or goat farmers
- 1,200 cooperatives and private-sector traders
- 77 livestock markets
- 250 slaughterhouses

### DATA RECORDED ON A TOTAL OF OVER 30 MILLION EVENTS (CATTLE) EACH YEAR

- 8 million births
- 15 million movements (move-outs and move-ins)
- 6 million slaughter operations
- 1.1 million live-animal exports
- 75% of the records transmitted by electronic data interchange

At national level, the Institut de l'Élevage has a permanent mission to provide technical support to the Ministry for Agriculture and to oversee all-round system engineering.

In particular, it is in charge of operational system architecture and coordinating the allied national information system, defining methods and procedures, official approval testing on the ear tags, and R&D initiatives for integrating new technologies (which in recent years has revolved around electronic identification).

At regional level, the 'ARSOE' [regional livestock organization support services] are responsible for the development and operational deployment of software, databases, and regional-scope information systems. These computer resources collect and compile the vast majority of all animal identification-related information: zootechnical performance data, genetics data, veterinary health data...



The ARSOE also provide livestock breeders, government agencies and other livestock breeders associations with valuable, exploitable information.

At departmental level, the official **department livestock offices (or 'EDEs')** manage operational deployment of the system in terms of animal and farm identification, inspections and recordings of animal identification and movement data, issuing official documents, handling incoming ear tag orders, providing technical framework for livestock keepers, and other field-level missions...

5

## Breeders organizations play a pivotal role

Once these national animal ID/traceability systems were up and running, the Ministry for Agriculture delegated organizational and field application responsibility to breeders organizations.

Operating under Ministry authority and guidance, the breeder organizations are in charge of running these national schemes and information systems, compiling and transferring the information input that is sent on to national computerized databases (including the 'BDNI') managed by the Ministry for Agriculture.



CONSEIL GÉNÉRAL 08

## FRENCH LIVESTOCK SECTOR

# An effective safety system

French genetic stock gets exported to countries and markets across the globe. It reflects worldwide recognition of the reliability of the national animal health control system and the guarantees it assures for our partners abroad.

Today's results bear the fruit of tight-knit collaboration between government-sponsored animal health agencies, breeder organizations and private-sector vets. In France, ensuring pristine health for the national herd stock is a shared concern.

### 1

## A sanitary quality guaranteed by the State

The impeccable animal health guarantees needed for cross-border trade are certified by government vets appointed to the Ministry for Agriculture veterinary services division. These guarantees are built on a vast regulatory screening and routine follow-up system that is rigorously applied nation-wide.

Animal diseases qualified as "notifiable", meaning they are subject to legally-enforced disease prevention and control programmes, encompass:



- zoonoses (infectious diseases that can be transmitted to humans), such as brucellosis, tuberculosis or rabies;
- highly contagious diseases with major economic damage to infected farms, such as foot-and-mouth disease;
- diseases that have major negative repercussions on trade, such as infectious bovine rhinotracheitis (IBR) or warble fly infestation.

2

## Pro-active surveillance delivers meaningful results

This targeted strategy has enabled France to stay officially (according to OIE criteria) tuberculosis-free since 2000, bovine leucosis-free since 2004, and bovine brucellosis-free since 2005 (zero outbreak site detected since 2004), and to swiftly bring bovine spongiform encephalopathy (BSE) under control.

These exceptional results were made achievable by a pro-active surveillance effort and outstanding reactivity, as demonstrated by the way France was able to deal with the handful of foot-and-mouth cases recorded in 2001 and the epizootic bluetongue outbreak of 2006.



### A NATIONAL CATTLE HERD WITH :

- Tuberculosis-free official status since 2000
- Bovine-leucosis-free official status since 2004
- Bovine-brucellosis-free status official since 2005

France is set to press ahead with this system by setting up a **new dedicated national epidemiological surveillance platform** which is designed to immediately detect any new zoonoses that could potentially find their way into the country (such as Rift Valley fever).



3

## Generalized screening

Every year, the entire French cattle herd is systematically put through screening as a statutory requirement. Five diseases are currently controlled under a nationwide disease prevention scheme: tuberculosis, brucellosis, enzootic bovine leucosis, infectious bovine rhinotracheitis (IBR) and warble fly infestation.

These systematic routine screening schemes serve as the basis for an official qualification awarded every year to the herds that meet the requisite tuberculosis, brucellosis and leucosis conditions.

Any new animal brought into the farm gets health-tested so as to maintain the farm's qualification. This new-import animal is kept isolated from the herd until its test results come through.



### PRODUCTION ALSO SUBJECT TO ULTRA-STRINGENT QUALITY REQUIREMENTS

The production of each dairy farm is control-checked by regular tests (at least 3 times a month) analyzing a set of 8 physical, bacteriological and chemical criteria. These control-check recordings on dairy output from every farm in the nation are performed by 17 accredited labs across the country that are all fully independent from the dairy industries.



In addition to checking that dairy output is free of inhibitors (antiseptic and antibiotics) and pathogenic bacteria (including Brucella and Listeria, among others), the analyses are also focused on milk leukocyte content (indicators of udder infection) and butyric acid bacteria spores (which become harmful at the cheesemaking step). Stringent standards have been set on factors such as germ counts (less than 100,000/mL) and leukocyte counts (less than 400,000/mL).

Every year, over 23 million elemental analyses are performed, on top of the 60 million elemental analyses performed under the official milk recordings system. In sum, a total of over 83 million elemental analyses, which averages out at over 1,000 milk quality testing analyses per year on every dairy farm in France.

## 4

### A full sanitary traceability



The official animal health certificate (the 'ASDA' in French) attached to the animal's ID passport must stay with each bovine throughout its movements.

These documents are issued under the same

national animal ID/traceability system that has been ensuring full end-to-end traceability on livestock movements for over 30 years now.

## 5

### Strict monitoring in every herd

Since the year 2000, it has been a legal requirement for all livestock keepers to keep an up-to-date farm register.

On top of the basic animal ID data (inventory, passport, animal movement licenses, and so on), this register goes further by logging a vast array of animal health-related interventions: name of the veterinary services, date of the intervention, drugs and doses administered, treatment duration, holdback period before products are allowed to go on sale, and more.

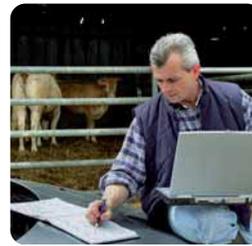
This logbook also has to include an up-to-date file compiling all prescriptions, bills for veterinary drugs and medicated feeds, animal health test results, health assessments and veterinary inspection reports, delivery orders and labels for all feed purchases, etc. Livestock farmers are required to conserve all the documents compiled into their livestock register on-farm, and for at least a 5-year retention period.



The whole health events throughout the life of each animal are also recorded and traced thanks to the national information system and database called SIGAL managed by the official veterinary services of the Ministry of Agriculture.

This pro-active surveillance system runs right through to the slaughterhouse, where Ministry for Agriculture-appointed vets complete their inspections, including screening tests for tuberculosis (all carcasses systematically examined) and BSE (systematic screening on all cattle aged >48 months; systematic withdrawal of all Specified Risk Materials - SRM).

#### FURTHER GUARANTEES BROUGHT BY 'GDS'



Livestock health protection groups called « Groupements de Défense Sanitaire » (GDS) are breeder organizations created through French post-war policy as a département-level first line of defense against the threat of a foot-and-mouth outbreak at this time.

These opt-in group-led organizations play a key role. They have proven particularly valuable for efficiently engaging active participation from livestock keepers, providing a platform for success on a series of ambitious animal health programmes led over the past 50 years.

The GDS have thus far efficiently developed specific prevention measures for animal diseases that, although 'non-notifiable', still have direct economic impacts on livestock farming, such as bovine viral diarrhoea (BVD), neosporosis, paratuberculosis and Q fever.

By liaising with public and private-sector animal health authorities, the GDS enable their members to benefit from additional animal health, hygiene standards or even certification programmes, all of which are approved by official veterinary health services under French national animal health certification association (ACERSA) schemes.

#### A NATIONAL COLLECTIVE MANAGEMENT THANKS TO THE ACERSA

The ACERSA is a national agency network spanning the entire animal health chain (from Ministry for Agriculture veterinary agencies to GDS, veterinary practices and veterinary testing labs) run through a coordinated participatory management set-up.

The ACERSA mobilizes this participatory-driven network to:

- manage the delivery of official qualification certificates for herds (IBR-free, warble fly-free) and animals (non-BVD-PI) in accordance with specifications drafted specifically for each disease threat. Certificate validation hinges on passing regular audits;
- designing and drafting health control strategies for farm livestock diseases such as BVD, paratuberculosis or Q fever;
- project consultancy services for feasibility analyses prior to drafting health control or health-hygiene qualification plans.



CNIEL

**FRENCH LIVESTOCK SECTOR**

# High-quality products

French farmers and food production sectors share a long history of nurturing a product offer with specific quality specifications.

France's unparalleled experience with official recognition of outstanding product quality schemes, from product designation protection to consumer-focused product quality guarantees, has essentially provided the template adhered to by European regulations.

**1**

## A long-standing concern nurtured by farmers, sectors and government

Improving breed genetics value is a decisive factor for successfully enabling livestock farmers and food sector to achieve productivity gains. However, it also acts as a driver for improving the quality of the products marketed.



Alongside production process and home production zone, the characteristics of each individual breed also play a role in shaping product quality - characteristics such as protein content, casein



profile, omega-3 content, finesse of the muscle fibers, marbling, collagen content, and so on.

On these grounds, and in response to consumer expectations, the ability to offer high-quality products delivering guaranteed characteristics has been a long-standing concern in France. The first modern law awarding an AOC issue was published back in 1925 for Roquefort cheese, and was based on legal records dating all the way back to 1666...

The genetic heritage of the French national herd stock coupled with the skilled experience of French breeders and a vibrant supply sector have since continued to lift the quality of this product.

The French Ministry for Agriculture has progressively built up a legal, technical and regulatory framework making it possible to issue official recognition to the most outstanding products, protect their origin, and provide consumers with guaranteed product characteristics.

2

## Four official symbols of product quality and origin

The Appellation d'Origine Contrôlée (AOC) (Protected Designation of Origin PDO within the European legislative framework) is a designation of geographic origin tied to a strictly-boundaried microregion. It guarantees tight links between a product, its local production area, and traditional recognized know-how (in production and/or processing). The interaction between natural, climatic, physical and human factors lends the products its unique set of specific typical qualities.



Protected Geographical Indication (PGI) designates a product originating from a certain geographical area and that possesses a specific quality, reputation or other characteristics attributable to that geographical origin. Like the PDO, it is governed under Council Regulation (EC) No. 510/2006.



3

## A strong state involvement and state-backed guarantees

France's unparalleled experience with official schemes for labelling outstanding product quality has essentially templated the Europe-wide system introduced over 1991-1992 (and refreshed in 2006) on the quality and origin policy governing agricultural products and foodstuffs (Council Regulation (EC) No. 510/2006).



In France, official quality symbols are strictly controlled by the Ministry for Agriculture. The management side of this control mission is mandated to the INAO [French national product origin and quality management agency], which was created in 1947 by appointment of the Ministry.

The INAO's mission is to analyze the production specifications submitted, adjudicate on whether to award official symbols of quality and origin, approve product control plans and oversee that they are applied, and to issue advisories on accreditation for control (COFRAC standard 45011) or inspection bodies (standard 17020).



The Label Rouge (Red Label), created in 1960, certifies that the labelled product possesses characteristics that lend it a superior level of quality compared to other similar products. At each stage in the production process, the Label Rouge product has to meet a series of taste and quality specifications that are double-checked by regular inspections, including taste tests and sensory profiling.

The Agriculture Biologique symbol ('AB' in France, for organically-farmed) is a guaranteed seal of quality tied to a mode of production that prioritizes environmental and animal welfare interests. Working to exceptionally stringent production specifications and systematic control inspections, the first official recognition of organically-farmed products in France dates from the national agricultural policy reform of 1980, followed at EU level by the core 1991 regulations that have since been amended and revised.



The INAO's decision-making process canvasses input from representatives from the production, processing and distribution industries, consumer groups, qualified experts and administrative agencies.

Inspections on product conformity and specifications compliance are subsequently taken over by independent, accredited inspection or certification bodies, which are themselves regularly inspected by government authorities.

### DAIRY PRODUCTS

- 9 Label Rouge (Red Label)
- 49 Protected Designation of Origin (PDO)
- 5 Protected Geographical Indication (PGI)



### MEAT PRODUCTS

- 51 Label Rouge (Red Label)
- 6 Protected Designation of Origin (PDO)
- 18 Protected Geographical Indication (PGI)



**FRENCH LIVESTOCK SECTOR**

# International trade shows

All throughout the year, the major French trade fairs propose a comprehensive offer for farmers and industrial operators involved in bovine, ovine and caprine sectors. Reflecting the performance of the French livestock sector, they offer an excellent opportunity to learn more about its genetics, its products and the expertise of its industries.

Foreign visitors will enjoy VIP reception services: International Business Club, specific farm to or agroindustrial site tours, with French specialists and interpreters, organization of business meeting ...

### The International Agriculture Show

In late February every year, what is used to be called the largest farm in France sets up at the gates of Paris.



With over 4,600 specimens of 360 breeds of animal on show, along with 1,100 exhibitors from every segment in the agricultural and livestock value chains, the Paris

International Agriculture Trade Show offers its 700,000 visitors an exceptional gateway to the French livestock industry.

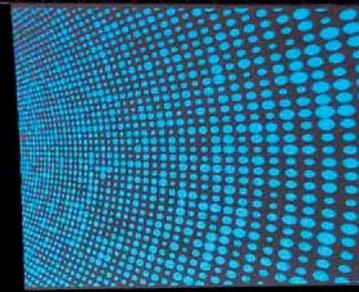
The International Agriculture Show also host to the Concours Général Agricole [Official General Agricultural Competition], sponsored by the Ministry for Agriculture since 1870, with 2,200 animals competing, presented by 1,450 breeders.  
[www.salon-agriculture.com](http://www.salon-agriculture.com)



### 5 KEY INTERNATIONAL TRADE SHOWS

- 21 days of exposure
- 1 million visitors
- 8,600 animals
- 4,000 exhibitors
- 35,000 foreign visitors





SOMMET DE L'ÉLEVAGE



### Sommet de l'Élevage

Located at the heart of the Massif Central, in the largest beef cattle farming region in Europe, the Sommet de l'Élevage has become for 20 years the must-

attend event in the livestock industry agenda, especially for actors in the beef production chain.



SOMMET DE L'ÉLEVAGE

During 3 days in early October, this heavyweight business forum and trade show host to over 2,000 specimens of top-class genetic value from over 60 cattle, sheep and horses breeds for 75,000 professional visitors in 150,000 m<sup>2</sup> of exhibition space.

[www.sommet-elevage.fr](http://www.sommet-elevage.fr)



### SPACE

Held every September in Rennes at the gateway to Brittany - the leading livestock farming regions in all Europe-SPACE offers a comprehensive program to the animal farming industry, from herbivores (dairy and beef cattle, sheep) to monogastric animals (pigs, poultry and rabbits).

In the course of the 4-day event, 700 broodstock from 12 different cattle breeds go on show. With 110,000 visitors and 1,300 exhibitors, SPACE, after 25 annual editions ranks now as the second-largest livestock trade fair in the world.

[www.space.fr](http://www.space.fr)



### Aquitanima

Every year in May, Bordeaux hosts Aquitanima - a leading venue for cattle genetics, showcasing the best of breeds from south-western France (Blonde d'Aquitaine, Bazadaise, Charolaise, Limousine, Prim'holstein et Gasconne).

It's also a not-to-be-missed opportunity for getting to know the wine, gastronomy and all-round charm of Aquitaine - the leading agricultural region of France.

[www.salon-agriculture.fr](http://www.salon-agriculture.fr)



### Tech-Ovin

Every two years, in September, the Limousin region hosts Tech'Ovin the only French trade fair dedicated exclusively to the sheepmeat sector. For more than a decade now, the entire sheep sector assembles at Bellac (Haute-Vienne) to learn more about the latest technical,

material and equipment innovations in modern sheep farming.

[www.techovin.com](http://www.techovin.com)



P. PULVERY

## FRENCH GENETICS

# A national and collective organization of genetic improvement

1

## Founding legislation in 1966

The quality and constantly-improving results of French-led genetic selection programmes are grounded in France's unparalleled experience. First and foremost, the experience of the grassroots livestock keepers who, first on their own and then through breed associations, ushered in animal selection based on phenotypic breed traits.

Since the mid-20th century, this empirical approach took a huge leap forward with the advent of quantitative genetics.

**In order to get the most out of these new scientifically-driven opportunities, a set of policy guidelines was defined for the French genetic improvement system under the 1966 Livestock Legislation.**

This legislation laid down foundations for modern selection programmes to be led under a nationally-coordinated group-led organization setup: a unique and unified animal ID system, on-farm performance data recording, progeny testing on candidate breed-standard AI stock stud animals, the creation of a technical institute missioned with supporting these programmes via methodology coordination and technical assistance, among other initiatives.



LA BORIE D'IMBERT

### KEY FIGURES

- 50 breeds under official selection programs
- 82,770 farms under official performance recording
- 4.7 millions cows, sheep and goats under official performance recording
- 6.4 millions purebred inseminations
- 8,700 bulls, rams and billy goats with individual on-station testing
- 2,000 bulls, rams and billy goats with progeny testing



## 2

### A national and collective organization

From the 1970s on, French selection programmes have undergone unparalleled progression as selection populations increased in size, new scientific knowledge has been applied, and technological innovations have been integrated.

However, the entire system still revolves around the same founding principle: a nationally-coordinated, group-led organization. By pooling a share of the costs, technical services and selection tools between regions, species and breeds, the scheme enables any

scheme-member breeder, whatever breed they are working with and wherever their flock is raised, to benefit from:

- progress made in science, technology and methodology;
- cross-industry services delivering the same levels of quality and objectivity;
- reliable, standardized protocols.

For nearly 50 years now, this nationally-coordinated, group-led organization setup has been able to federate a massive number of breeders, preserve a majorly important national biodiversity, and generate substantial genetic progress and improvement in every livestock breed, all converging to drive livestock industry-wide development.

## 3

### Efficiency and objectivity as the watchwords

Each phase-step in the selection programmes (identifying and certifying parentage, on-farm performance data recording, individual on-station stud testing, etc.) is carried out by specialist breeder organizations that are legally independent of the breed associations.

This pioneering organizational framework facilitates the acquisition and development of the specific competencies needed for each function and makes it possible to locally deliver fully independent community services to those operators directly involved in the process of gaining market value from stud animals.



## 4

### Cross-sector cohesiveness and reliability



Within each farm species, the methods and procedures followed at each step in the selection programme are exactly the same for all breeds that are raised for the same purpose (meat or dairy).

At national level, the mission tasked to the Institut de l'Élevage [French national livestock institute] is to define and revise these methods and procedures, and where necessary, to deliver training and approvals to the technicians applying them.

This means that all dairy cattle breeds ultimately follow the same set of procedures for pedigree management, on-farm performance data recording, progeny testing, genetic evaluation, and so on. However, each breed obviously gets to keep hold of its own dynamics in terms of selection policy and objectives.

For each species, data recording, quality control, and all data processing and publishing are channelled through the same unique National Genetics Information System. Along the same lines, all of this data is compiled into the same unique national database, which is State-run through the public French National Institute for Agronomics Research [INRA].

## 5

## Broad participation and stringent requirements

In order to address the broadest possible genetic variability, the number of animals in each breed and the number of breeding centres enrolled in selection programmes need to be as high as feasibly possible. **With over 3.4 million females on 60,000 farms, the French cattle breed selection populations (animals with full herd-book/pedigree records and on-farm performance data recordings) have grown to levels that rank them among the biggest in the world.**

However, in order to keep selection pressure strong, very few of the studs in these baseline selection populations actually get qualified for natural servicing or authorized as breed-standard AI stock.

The only animals that win through from each generation are those that have proven to be genetically far superior to their contemporaries.

Consequently, only fifty-odd bulls from all the beef cattle included every year will ultimately get shortlisted as breed-standard AI stock from the offspring of 900,000 on-farm performance-tested cows and the 2,000 on-station performance-tested young candidate stud bulls.



CIV

## 6

## National steering by France Génétique Elevage

In order to lend this vast scheme the requisite core cohesiveness, the 1966 legislation created the CNAG [a National genetic improvement commission] as a centralized coordination and leadership body chaired by the Ministry for Agriculture and composed of experts from public research bodies (including the INRA) and breeders organizations (including the Institut de l'Élevage).

This permanent policy orientation and guidance commission operating under Ministry for Agriculture authority was subsequently mandated to handle approvals for technical organizations, selection programmes, technical protocols, candidate breed-standard AI stock bulls, forward planning and analysis of policy needs, drafting proposals on regulatory amendments, and more.



The exemplary level of efficiency and rigorousness achieved by the breeders associations has since prompted the government to transfer this coordination and leadership mission over to France Génétique Elevage

(via the 2006 national agricultural policy reform) as cross-industry trade organization for the genetic improvement of ruminants.

FGE federates input from every technical-focused organization involved in each link of the selection programmes chain and from the representatives from all the allied breeders associations (FNB, FNPL, FNEC, FNO).

### QUALITY MANAGEMENT OFFICIALLY RECOGNIZED AT INTERNATIONAL LEVEL

In order to further consolidate the continuous improvement approach that has taken French genetics to its current leadership position in the international arena, France Génétique Elevage has engaged since 2008 its entire system framework and the allied organizations in an overarching Quality Management System (QMS).

This QMS, which was designed to ISO 9001:2008 standards and covers all technical organizations and all breeds for every process impacting outcome quality.



In 2010, France Génétique Elevage was awarded the ICAR (International Committee for Animal Recording) Certificate of Quality for all of its activities falling within the scope of genetic improvement for dairy and beef cattle. This certificate was renewed in 2013 by ICAR.

This is yet more evidence of the reliability of the French procedures, which secures the impartiality of its evaluations and the quality of its products.



7

### An efficient collective value-chain to support genetic progress

For the sake of efficiency, every stage in the genetic improvement programmes is managed by a specialized organization.

#### FRANCE GENETIQUE ELEVAGE

as the national value chain organization for the genetic improvement of ruminants:

- **gathers under a single umbrella** both the aforementioned specialized organizations as well as those representing livestock farmers (FNB, FNPL, FNO, FNEC),
- **guides and coordinates** this vast collective set-up
- **ensures** that new scientific knowledge and technological innovations are constantly assimilated.



UCEAR

#### THE NATIONAL INDIVIDUAL IDENTIFICATION SYSTEM



The national identification number is the basis for recording all the information related to a single animal all throughout its life: information on husbandry, pedigree, health, genetic information, and more.

This is considered as a key asset allowing a wide range of collected data to be readily available with a reliability level securing the precision of genetic indices.

The Chambers of Agriculture are locally responsible for operating the system.



#### BREEDING OBJECTIVES



The breeding objectives for each breed relates to precise and diverse criteria: productivity (quantity and quality of product) and functional traits (fertility, longevity, morphology, stance, etc.).

The Breeding Organizations responsible for their definition and for herd book maintenance and for breeding livestock classification are gathered under a single national umbrella "Races de France".



#### RIGOROUS METHODS AND PROCEDURES



In order to provide rigorous and consistent procedures, the technical protocols for each stage are identical for all breeds in a species raised for the same purpose (meat or milk).

### COLLECTION AND RECORDING OF HUSBANDRY DATA



The collection and recording of husbandry data (productivity, functional traits) concern over 4.9 million animals in 70,000 farms.

Such performance recording, along other related services, is provided by technical organizations independent from the breeding organizations.

They are federated at national level in "France Conseil Elevage"



### SELECTION OF BREEDING ANIMALS



The selection of breeding animals is based on performance recording of over 7,000 males produced from mating best performers within each breed.

These very wide-range programmes are conducted by Breeding Companies that are also responsible for the production and for providing insemination service.

They are represented at national level by UNCEIA.



### THE NATIONAL GENETIC INFORMATION SYSTEM



All data on pedigree, parentage, husbandry and so on are recorded in a single national genetic information system that feeds into the national genetic database.

Every year this involves data recording, monitoring and processing of over four million animals. Data include records for 26 million basic results from milk recording, 7 million inseminations, 1.6 million live weights, etc.

This network for the exchange of livestock farming data and related services is run by regional IT service organizations (ARSOE) under a national umbrella: FIEA.



### GENETIC EVALUATION OF BREEDING ANIMALS



Independently of all livestock farmers' organizations, the government has taken responsibility for the genetic evaluation of breeding animals as a guarantee of objectivity.

Using the most modern statistical methods (BLUP or Best Linear Unbiased Prediction for example), the computation of genetic values (indices) takes into account all the parentage factors and corrects for environmental effects.

This scientific work is carried out by INRA (the French national institute for agricultural research), which also runs the National Genetic Information Database.



They are defined and updated by the Institut de l'Élevage, (the French livestock farming institute), which also provide technical assistance to all the organizations taking part in genetic improvement programmes.

For 40 years, this national research and development organization has also been responsible for overseeing and providing technical assistance for national identification/traceability systems.



The CNBL is the national consultation organization for technical and genetics issues in the milk sheep sector.

It's coordinated by the Institut de l'Élevage.



FOTOLIA

## FRENCH GENETICS

# Genomics selection, revolution is underway

The fact that France has successfully integrated genomics science into its selection programmes is a major technological leap forward.

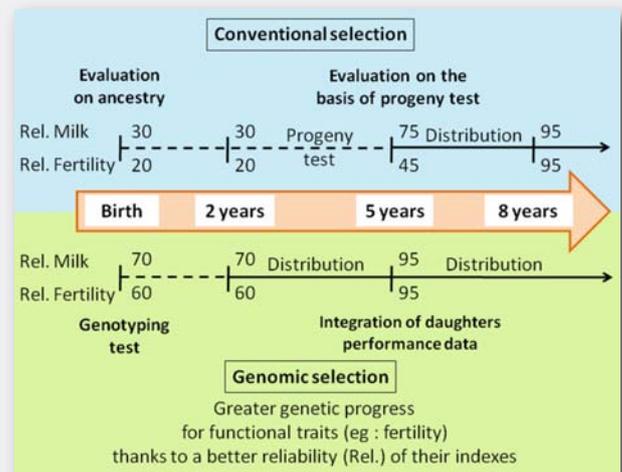
The size of the reference breed populations coupled with decade-long optimization of the scientific methods used enables robustly reliable genomics evaluations on every trait conventionally evaluated on progeny.

## 1

### A technology-driven revolution for new perspectives

In addition to data used in conventional evaluations (pedigree and performances), **genomic selection exploits the added value of information garnered through DNA analysis via new DNA mapping-based genotyping technologies.**

Genomic selection does not involve any genetic modification: neither the animals evaluated nor their genetic potential become modified. Genomics 'simply' offers a powerful new tool for assessing the genetic quality of livestock.



These breakthroughs have now made it possible to evaluate a breeder sire even before it has reached maturity, without having to wait for its progeny to start producing.

**The net result is that genomic selection enables to increase greatly annual genetic gain. Furthermore, indexing on functional traits (such as fertility, mastitis resistance, calving ease) is now much sharper than before.**

Genomic selection has been the biggest technology-driven breakthrough to happen in genetic improvement over the last 40 years.

2

## Size the decisive factor for breed reference populations

The pivotal first step in the genomic evaluation of sires in a given breed is to build up a reference population - a **purebred set of fully genotyped and progeny-tested breed animals**.

This population serves as a basis for analyzing genotype-performance relationships. Mathematical modeling has established statistical relationships between genotype profiles and the indexes calculated after progeny testing.

**The robustness of these formulae for predicting genetic values from genotypes hinges on the number of animals making up the reference population. The larger the reference population, the sharper the statistical correlations.**

Once these predictive formulae have been established and verified, they can be employed to estimate a series of genetic indexes for a young animal using its genotype data.

This means that the genomic evaluation can only focus on the progeny-tested traits. The reference population still has to be renewed every year by progeny testing new animals in order to continually optimize the predictive formulae.

**The genomic evaluation can therefore only be efficient if it gets a regular input of dense (size of the reference population) and fresh (population re-updating) information.**



OS-PRIMHOLSTEIN FRANCE

3

## France among the world leaders

France was one of the first countries in the world to gain official international validation from Interbull on its genomic evaluation protocols.

This position at the leading edge of genomic selection has been built up through long-term close cooperation between members of the France Génétique Elevage network.

Currently this cooperation brings together the national federation of selection-industry businesses (UNCEIA), the selection businesses themselves, the Institut de l'Élevage [French national Livestock Institute], and the INRA [French national institute for agronomics research] which delivers the basic research component.

**The French genomics-enhanced evaluation method has been comprehensively optimized through ultra-accurate progeny tests and major investment in methodological input.**

The reliability of these genomic indexes stems from the hugely robust size of the reference populations: 1,250 Normande-breed bulls, 1,500 Montbéliard-breed bulls and 18,300 Holstein-breed bulls, all within the framework of the pan-European EuroGenomics project.

Since 2009, impelled by an UNCEIA-led initiative, Europe's leading Holstein breed selection businesses joined forces to pool the reference population datasets (the EuroGenomics project).



**Counting over 18,000 fully genotyped and progeny-tested purebred Holstein bulls (and 19 millions daughters!), this vast one-of-its kind reference**

population has been built on the best genetic material that Europe and North America can provide.

Although each country still works with its own evaluation methods, the EuroGenomics project partners now co-use a pooled reference population. Compared to genomics evaluation based on a national-scale reference population the gain in accuracy is 10%.

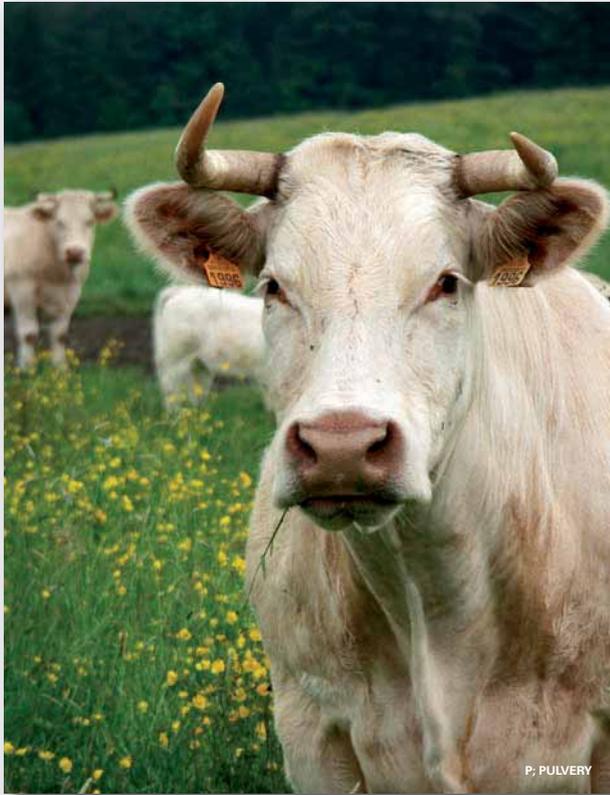


Gojo

4

### Consolidated assets and new perspectives

The other dairy and beef cattle breeds, as well as sheep and goat breeds, are soon to reap the benefits of the genomics revolution.



With experience built in and new output from large-scale scientific research programmes, **genomics-based evaluations are set to be extended to encompass criteria** that conventional selection programmes are incapable to integrate, such as milk composition components with positive (or negative) effects on human health (fatty acids, etc.), disease resistance, meat quality (tenderness, marbling, flavour, and more).

The critical prerequisite for developing robust predictive formulae is to work with a reference population comprising fully genotyped animals on which these specific traits have also been measured.

That is the main purpose of 2 programmes led by the INRA, the UNCEIA, the Institut de l'Élevage and selection-industry businesses.



- **Phénofinlait** (advanced compositional analysis of the milk from 20,000 genotyped cows, goats and sheep)
- **Qualvigène** (meat quality analysis on over 3,000 young bulls genotyped).

As with the Holstein, Montbéliard and Normande breeds, the next generation of breed sires will not be marketed until their genomics-enhanced evaluations gained proven reliability, international acceptance and recognition.

These are the basic condition to achieve our quality expectation.

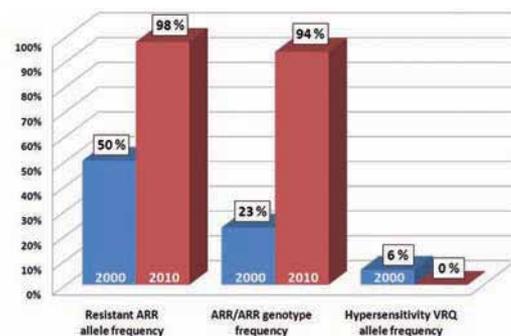
#### LARGE-SCALE SELECTION OF A MAJOR SHEEP GENE

**The National Genetic Improvement Plan for Scrapie-Resistant Sheep**, encompassing provides to all French sheep breeds a unique case-illustration of very-large-scale selection for a major gene : PrP gene that confers varying degrees of scrapie resistance.

The scheme coordinated the genotyping of over 670,000 sheep in the space of 6 years, with the onus on eliminating breeder rams carrying the PrP gene susceptibility alleles (VRQ and AHQ) and disseminating those carrying the resistance alleles (ARR).

**The results command attention.** Since 2008, there is not a single ram from any farm in the sheep meat breed selection population that possesses the VRQ scrapie hypersensitivity allele. Furthermore, over 95% of them are scrapie-resistant (ARR/ARR genotype).

#### A VERY EFFECTIVE GENOMIC SELECTION



Source : PNAGRT / Institut de l'Élevage 2009



UNCEIA

## FRENCH GENETICS

# Tighter controls for sperm doses and embryos

In addition to the national safety system, strengthened process-specific veterinary health measures are governing the entire semen dose and embryo production process, from on-farm selection of future sires and donor stock through to semen freezing and the conservation of genetic material.

Armed with these competitive advantages, French genetics is able to meet the most exacting veterinary health specifications of global customers.

## 1

### Stringent protocols

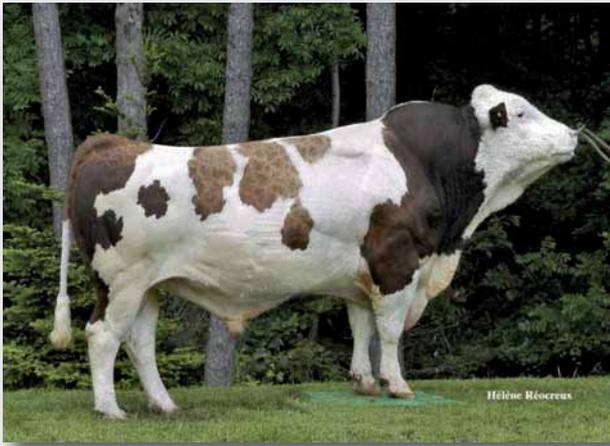
French veterinary health legislation on animal reproduction is calqued on the toughest European directives. It also meets the requirements set by the OIE Terrestrial Animal Health Code. Points defined include:

- the animal health control conditions governing animal entry and maintenance in semen collection centres;
- the conditions governing accreditation and approvals for the agents ;
- health-hygiene and disinfection rules to scrupulously follow for semen preparation and storage.



All the veterinary health protocols are applied under constant surveillance co-led by the French national stud animals inspectorate [LNCR], head veterinarians, and officially-mandated veterinarian services.

These mandated veterinarian services run quarterly surveillance visits to accredited centres, and are therefore well placed to certify full compliance on all regulatory requirements. Certification signed and stamped by the veterinary services seals official guarantee of the sanitary quality of all every single semen export.



2

### Animal health inspections on-farm and then before entry to the collection centre

In order to be awarded the requisite animal health approval, young bulls earmarked as future semen donor stock must

- come from a herd that is 100%-free of tuberculosis, brucellosis, or enzootic bovine leucosis;
- be 100% IBR-free (ACERSA status A) like their dam inspected as the bull calf leaves for the semen production centre;
- be born to a dam that lived completely free of any contagious disease for the whole 6 months leading up to the bull calf's birth.



UNCEIA

#### A CUTTING-EDGE TRACEABILITY SYSTEM

The dependable reliability of the animal health control system governing the French genetics sector also hinges on a traceability system capable of charting the path of a semen dose from production through to end-use.

Since 2004, all French semen production centres print each straw produced with a 10-digit barcode that identifies donor bull, day of collection, and intra-ejaculate batch number.

In 2007, 3 more digits were added making it possible to ID the semen production centre from within an international database. The official listing of all approved and accredited centres in Europe is managed by the International Committee for Animal Recording (ICAR).

Before gaining entry to the semen production centre, these young bulls are sidelined at a quarantine station for at least 56-day isolation period.

During this period, they are put through several series of health control tests screening for the following diseases: tuberculosis, brucellosis, bovine leucosis, IBR (infectious bovine rhinotracheitis), BVD (bovine viral diarrhoea), neosporosis and paratuberculosis.

The final series of tests is rounded off with:

- a clinical examination of the internal and external reproductive system;
- analysis of the biological and bacteriological quality of the semen (to guarantee zero reproductive system infection)
- a dual control-check screening for sexually-transmitted venereal diseases (campylobacteriosis and trichomoniasis).

3

### Annual inspections on semen collection centres

Once a year, and with no more than a 12-month interval, all the bulls have to pass a series of regulatory health inspections screening for the following diseases: tuberculosis, brucellosis, bovine leucosis, IBR, BVD, campylobacteriosis, trichomoniasis, paratuberculosis, and bluetongue. The control-check protocols for bluetongue are readjustable and will integrate the health status of the animals (disease-free, vaccinated, immunized, etc.).

Elite bulls whose semen goes out for export to certain listed countries undergo a higher number of animal health inspections led at more regular intervals in order to meet these countries' own particular requirements.



FRANCE LIMOUSINE SÉLECTION

## 4

## The LNCR - the French National Laboratory for Stud animals Control

The LNCR is the independent French National Laboratory for Stud animals Control created back in 1952 by appointment of the Ministry for Agriculture veterinary services division, the national veterinary School-Alfort, and the French national union of AI cooperatives (UNCEIA).

The LNCR's mission is to guarantee top-bill health status for all cattle, sheep and goat studs whose semen is marketed in France and abroad. The LNCR, under mandate from the French Ministry for Agriculture, has **a permanent ongoing epidemiological surveillance mission extending to all stud animals, and runs continuous health risks analysis**. Its scope of authority covers semen and embryos (in vivo or in vitro products).

Every year, the LNCR runs over 350,000 analyses in its various specialized areas of expertise: on-site sampling and clinical examinations, andrology, bacteriology, virology, blood immunology, and molecular biology.

Samples are taken by specialist technicians driving mobile lab vans across France all year round.

Every site hosting sires gets inspected to a detailed timetable, enabling the technicians to meet the requirements governing annual frequency of animal examinations and veterinary checks.



This highly-efficient pioneering service enables samples to be collected and channelled to the lab under optimal conditions, thus ensuring the requisite reliability of analytical results.

## 5

## A comprehensive veterinary health record for each stud animal

The results of health control checks on every stud animal are then systematically recorded in the **French national registry of veterinary health data on stud animal (BNDSR)**, which is hosted and managed by the LNCR.

This records system makes it possible **to instantly check the veterinary health history of every single stud animal**.

The database of veterinary health is officially recognized by the French Ministry for Agriculture's veterinary services division, and is directly accessible to département-level authorities tasked with the protection of local populations and by the head veterinarians in charge. It is a key tool enabling the LNCR to efficiently fulfil the permanent epidemiological surveillance mission is has been mandated with.





B. BOURDIAU

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To download the file of brochure and find all additional information about French genetics for cattle, sheep and goat industries : [www.france-genetique-elevage.org](http://www.france-genetique-elevage.org)

# The dairy breeds selection: an exceptional situation



B. PRÉVE

## 1

### A variety of breeds with remarkable results

With 8.3 million heads of cattle, including 3.6 million dairy cows, France is the leader in dairy production in the European Union. The national herd includes a wide diversity of breeds, including the Prim'Holstein (2.4 million dairy cows), the Montbéliarde (640,000) and the Normande (374,000). Along with the Abondance, the French Simmental, the Pie-rouge des plaines, the French Brune and the Tarentaise, these eight breeds benefit from modern, effective breeding programmes, which produce significant and regular genetic advances.

The French national herd has an exceptional genetic range. It includes both internationally significant breeds with high yield levels and breeds that are well adapted to difficult feeding and climate conditions.

	COWS SUBJECT TO OFFICIAL MILK RECORDING	AVERAGE LACTATIONS (305 DAYS)	FAT CONTENT	CRUDE PROTEIN
All breeds	2,548,786	8,429 kg	3.9%	3.4 %
Prim'Holstein	1,687,730	9,135 kg	3.9%	3.3%
Montbéliarde	415,552	7,209 kg	3.9%	3.4%
Normande	229,635	6,689 kg	4.2%	3.6%
Abondance	22,763	5,545 kg	3.7%	3.5%
Brune	17,235	7,170 kg	4.1%	3.5%
Simmental	16,045	6,401 kg	4.0%	3.5%
Pie-rouge	10,221	7,888 kg	4.2%	3.5%
Tarentaise	7,660	4,532 kg	3.6%	3.4%

Equivalent Adult Lactations  
Source : Institut de l'Élevage / FCE 2012

## 2

### Breeding programmes among the world leaders

The French programmes combine selection of pedigree, planned mating, genotyping, animal-rearing data registration and progeny testing.

They are constantly being improved, and include the latest technological and scientific advances, particularly in terms of sanitary conditions and genomic evaluation.



With 330 bulls subjects to progeny testing and 45 000 genomic analyses in 2012, French selective breeding schemes rank among world leaders.

The results are outstanding: the average equivalent adult lactation of the herd evaluated for milk production stands at 8,429 kg in 305 days. The figure is 9,135 kg for Prim'Holstein.

**3,8**  
million dairy cows

**3,4**  
inseminated females (FAI)

**2,5**  
million cows in performance recording

**419** bulls with progeny testing

**60,000** genomic analyses (males and females)

**743** bulls selected for animal insemination

Data 2012



### 3

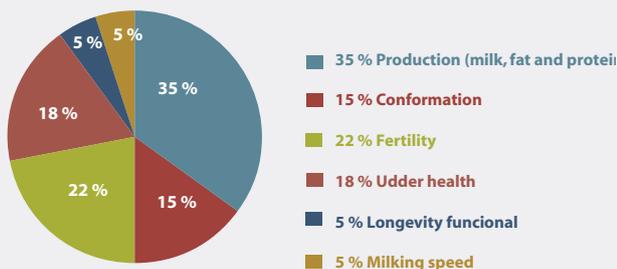
## Diversity and complementarity of breeding criteria

Each breed defines its breeding objectives, taking into balanced consideration precise and varied performance criteria relating to:

- **increasing the quantity and quality of the products** (milk, fat, protein).
- **improving functional traits** (fertility, resistance to mastitis, ease of calving, longevity, udder conformation, feet and legs, etc.) in order to reduce production costs. Genetic value indices are published for each of these traits. A global merit index (ISU) which is a combination of the different criteria, uses a specific weight for each breed.

Each breeder can thus choose his breeding stock according to the combination of qualities that is most appropriate for his objectives and his holding, in France or anywhere else in the world.

GLOBAL MERIT INDEX (ISU) PRIM'HOLSTEIN BREED



### 4

## Animal-rearing data enriched by genotyping

Genetic evaluation is based on:

- **Animal-rearing data recorded on the farm** (yield quantity and quality, type evaluations, etc.) for over 2.5 million dairy cows each year. These recording operations are carried out under the responsibility of technical bodies which are independent of the breed organizations.



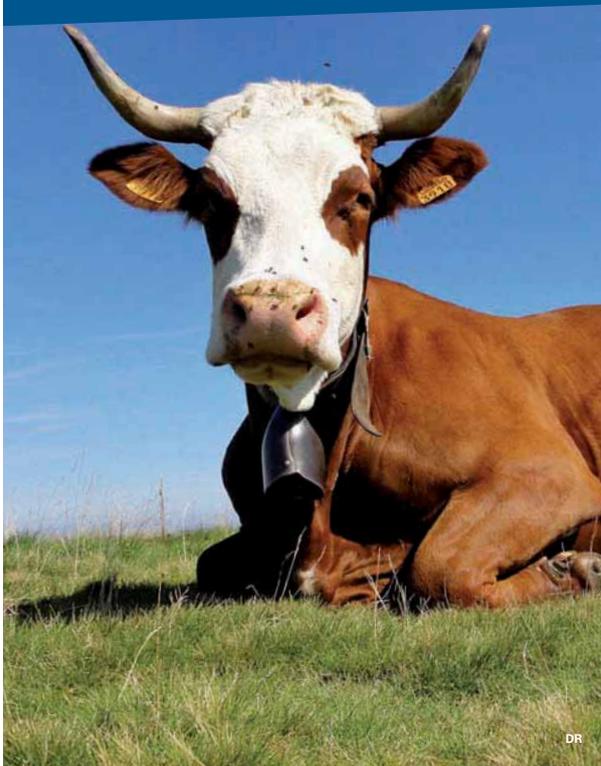
All these processes are subject to external checks and to a comprehensive quality management system, which is recognized internationally for its rigour.

Therefore, it enabled France Génétique

Elevage to obtain ICAR (International Committee for Animal Recording) quality certification.

- **The results of DNA analyses (genotyping)** of over 25 000 animals per year, carried out by LABOGENA. This genomic information enriches the animal-rearing data and makes it possible to make genetic advances even more rapidly.

This national laboratory performs genomic analyzes, for all species in the scope of animal identification and genealogy control, food products traceability and research programs on the genes involved in production traits or diseases.



DR



FOTOLIA

5

### Long experience in progeny testing

For over 40 years, the only French sires diffused on a large scale by animal insemination (IA) have been those whose genetic superiority has been proven by progeny testing or by genomic evaluation since 2009.

The young bulls preselected for progeny testing are the result of planned mating combining the search for specific qualities and the maintenance of wide genetic diversity. The final selection is rigorous. Only 25% of the preselected young males in the end proceed to progeny testing.

For each young bull, 300 to 1 000 AI are carried out in the same number of herds. **All the female offspring are tested on their yield, their functional traits and their conformation.**



According to the estimated breeding values calculated using these results, only approximately 20% of the bulls tested are kept for diffusion through animal insemination.

6

### At the cutting edge of progress in genome-based breeding

Since 2002, breeding programmes for the Prim'Holstein, Montbéliarde and Normande breeds have included genomic information obtained through DNA analysis.



Since 2009, all breeders can access to this full, new-generation genetic data. Since then, French Brown and Red-Pied breeds have also genomic evaluation. The genomic breeding values relate to all the traits evaluated up until that time on the basis of progeny (roughly 40).

**The successful incorporation of this technological revolution makes it possible to achieve even faster genetic advances in all the selected qualities (yield quantity and quality, functional traits).**

It also makes possible to offer a wider range of breeding stock, in terms of genetic diversity, performance (longevity, resistance to diseases, etc.) and other desired criteria (red colour factor, hornless, etc.).

In 2010, France was one of the first countries to get inter-bull official approval for its genomic evaluation method. The acquired experience will make possible to expand it just as successfully to other breeds of dairy cow.

7

## A broader offer for greater sustainability

Thanks to integration of genomics-based technologies, French genetic selection programmes are now able to offer an extended range of high-performance sires with sharper indexes on functional traits. These sires open up new perspectives for farmers in terms of improved genetic gains on traits that are pivotal to livestock system sustainability.

First, there was the conventional offer of progeny-tested bulls. Now, there is also a new offer of genomically-selected bulls in all three core French dairy breeds.

Following a long period dominated by the sons of just a handful of stud sires, the wide panel of Holstein sires now available offer much broader genetic diversity. Their profiles are adapted to a range of objectives: improved milk production, improved morphology, or improved functional traits.



This range, put together with high-ISU-index (all-round composite index) breed sires, also includes bulls boasting other sought-after criteria (redding, naturally polled...).

The Montbéliarde and Normande breeds have also been range-extended and rejuvenated to offer recent-pedigree sires and sires presenting profiles that showcase the hybrid vigour of their breed mix (good all-round value set, lifespan, mastitis resistance).

### CONVINCING AND RECOGNISED RESULTS

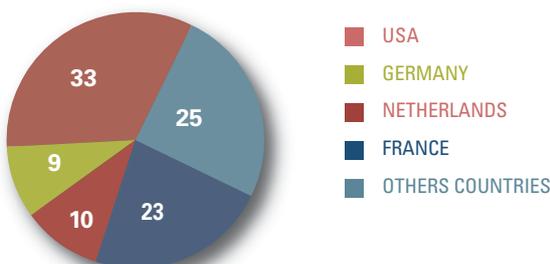
**For over 20 years, the annual genetic progress of the 3 main french breeds has been between 65 and 100 kg of milk.**

In 10 years, the annual average yield of a French Prim'Holstein cow has thus increased by 1 000 kg per lactation, thanks simply to the genetic improvement of the breed. This has been the primary factor of farm productivity increase over the last twenty years.

**The official international lists of awards published by Interbull regularly attest to the excellence of these results, known for their accuracy and reliability.**

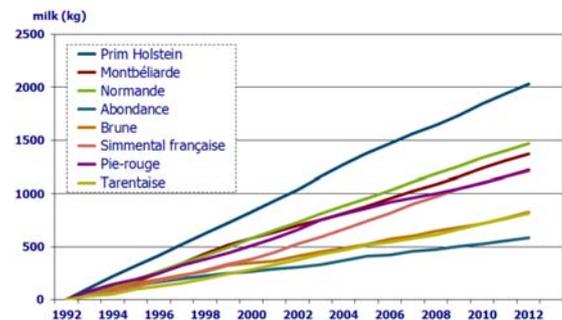
Since 1995, French sires have been amongst the best in the world. At the international Interbull evaluation in April 2011, France was ranked 2nd for Prim'Holstein breed, with 23 bulls in the world TOP 100. Among red-pied breeds, France ranked 1st with Montbéliarde breed,

#### INTERBULL INTERNATIONAL EVALUATION (APRIL 2011) NUMBER OF BULLS IN THE TOP 100 PRIM'HOLSTEIN GLOBAL MERIT INDEX



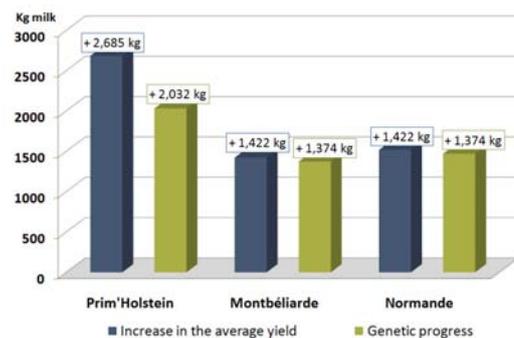
Source : Institut de l'Élevage / INRA / Interbull - 2012

#### HIGH PACE AND REGULAR GENETIC PROGRESS



Source : Institut de l'Élevage / INRA - 2012

#### INCREASE IN THE AVERAGE YIELD PER COW SUBJECT TO MILK RECORDING AND GENETIC PROGRESS (1992 TO 2012)



Source : Institut de l'Élevage / FCER 2012

# Abondance

## THE BREED IN FRANCE

49,780 cows  
2,214 farms  
22,763 cows under milk recording system  
10,842 cows recorded in the Herd Book  
25,565 inseminations (FAI)

## FRAME

Height at withers (adult cow): 140 to 150 cm  
Adult cow weight: 550 to 800 kg  
Adult bull weight: 850 to 1,100 kg  
Young-bull carcass weight: 300 to 350 kg

## TRAITS\*

Milk yield: 6,274 kg  
Milk yield (305 days): 5,545 kg  
Fat content: 3.7 %  
Crude protein content: 3.49 %

\* Official milk recording results 2012 - Mature equivalent milk yield  
Institut de l'Élevage & FCE



## Traits and performances

Abondance hails from the valleys of Northern Alps in Haute-Savoie and the breed is particularly well-adapted to mountain areas. Abondance cattle can withstand huge temperature swings as observed in mountain range conditions (from -10°C early-morning to over 35°C in late-afternoon), and is well adapted to rough forage.

Herd management follows a seasonal pattern: the animals are in-door overwintered (for 6-7 months, generally in tie stall barns) due to the tough climatic conditions, and then return to pasture mountain at between 500 and 2,000 m altitude for the entire summer. Spring marks the transition between these two extremes, when the flock feed on pastures around intermediate upland villages.

Abondance cattle get very little feed supplementation because they are able to exploit grass and hay-based rations to produce a protein-rich milk, well suited to cheesemaking. About 80% of Abondance milk is used to produce cheeses with Protected Designation of Origin (Appellation d'Origine Contrôlée - AOC) such as Reblochon, Abondance, Tome des Bauges and Beaufort, along with Protected Geographical Indication (IGP) cheeses such as Tomme de Savoie and Emmental de Savoie.

The hardiness of the Abondance breed and the quality of its milk made it very popular abroad, where it is farmed from Canada to South America (Chile, Mexico) to Middle East (Iraq, Iran, Egypt, Yemen).

The breed is used in crossbreeding programs specifically aiming at improving the milk yield performances of local-region breeds, as for example N'Dama breed in the Ivory Coast or Baladi breed in Egypt.

## Selection

The criteria targeted as priority factors in the Abondance breeding program are production indices, although special focus is given to improving crude protein content, which has a tangible effect on milk payments.

The program also breeds for longevity and adaptability to mountainous areas. Feet & legs, stoutness, respiratory capacities and udder quality are important criteria.

Its looks for compact udders (less likely to hamper cattle as they move around in mountains areas), well balanced, solidly attached (udders that will age well, i.e. that over time, will stay tight and not progressively hang down), with well-positioned teats and right length for milking.

Using these criteria as baseline, 35 weaned calves are selected every year for further individual on-station testing. Then, the top 20 young bulls is assessed through progeny testing. Finally, 3 to 4 new bulls a year are selected to be used for artificial insemination.

## MORE

Organisme de sélection Races Alpines Réuniones  
[www.osrar.fr](http://www.osrar.fr)

Entreprise de sélection UCEAR  
[www.ucear.com](http://www.ucear.com)

Races de France  
[www.racesdefrance.fr](http://www.racesdefrance.fr)

# Bleue du Nord

## THE BREED IN FRANCE

1,329 cows  
42 farms  
548 cows under milk recording system  
1,253 inseminations (FAI)

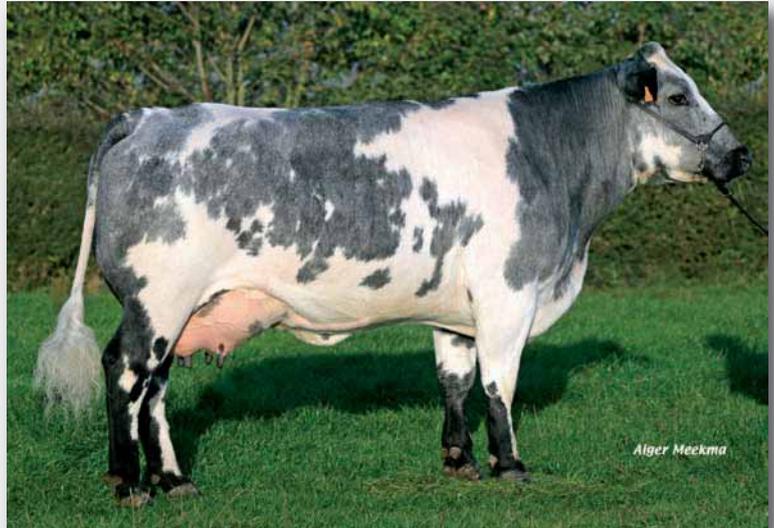
## FRAME

Height at withers (adult cow): 133 to 145 cm  
Adult cow weight: 700 to 900 kg  
Adult bull weight: 1,050 to 1,300 kg  
Young-bull carcass weight: 350 to 400 kg

## TRAITS\*

Milk yield: 6,108 kg  
Milk yield (305 days): 5,469 kg  
Fat content: 3.57 %  
Crude protein content: 3.24 %

\* Official milk recording results 2012 - Mature equivalent milk yield  
Institut de l'Elevage & FCE



## Traits and performances

The Bleue du Nord was born from combining the dairy traits of the Dutch Fresian with the finishing capacity of the English Durham breed. This means it was essentially at first a dairy breed. Although the breed was originally native to the Hainaut province of Belgium, it took a group of French farmers to "relaunch" the breed line in the 1970s.

While Belgian farmers in the 1960s decided to turn the breed towards a double-musclé livestock animal (thus creating the Belgian Blues), the Bleue du Nord was allowed to hold onto its dual purpose origin via the development of a specific breed line.

Although it produces tangibly less milk than specialized dairy breeds, it comfortably compensates with a far better carcass conformation. The breed carries the double-muscling gene, which is widely used in Belgium but only carried in 10 to 20% of French breed line.

The Bleue du Nord is well adapted to the climate conditions of its original host region: **frugal and rustic, accommodating cold and humid conditions**. The Bleue du Nord's main asset is its dual purpose and local initiatives attempt to add value to the breed in its home region.

A group of Bleue du Nord breeders have formed a cooperative to market well-finished animals under a specific label ("Bleue du Nord au cœur du goût") in farm direct sales. Alongside this initiative, the BLUESEL program includes a project to analyze the composition profile of Bleue du Nord milk and create a new breed-specific cheese.

## Selection

The Bleue du Nord breeding program is led under a partnership between French and Belgian breeders' associations and artificial insemination centers. The BLUESEL program launched in 2008 creates a platform for pooling on both sides of the border the bull dams and bulls for artificial insemination selection.

The Bleue du Nord breeding program is now a fully trans-border scheme. **On the French side, the core objective remains to improve dairy traits by setting high requirements for dairy productivity and udder conformation.**

By selecting 3 to 4 "mh/+" or "+/+" bulls and one or two "mh/mh" bulls every year, the program integrates the diverse genetic heritage targets concerning the double-muscling gene, which Belgian breeders tend to prize more than their French counterparts.

The bull dams are handpicked from the very best cows showing over 360 kg of milks solids and 3.5% crude protein content, a height at withers of over 137 cm, and no more than one caesarean per 3 calvings.

The AI bull stock is refreshed every 3 to 5 years with specimens handpicked from the very best French and Belgian bull stock.

## MORE

**Centre Régional des Ressources Génétiques  
Nord Pas-de-Calais**  
[www.enrx.fr](http://www.enrx.fr)

**Entreprise de sélection Gènes Diffusion**  
[www.ciagenesdiffusion.com](http://www.ciagenesdiffusion.com)

**Races de France**  
[www.racesdefrance.fr](http://www.racesdefrance.fr)

# Brune

## THE BREED IN FRANCE

26,295 cows  
1,065 farms  
17,235 cows under milk recording system  
10,246 cows recorded in the Herd Book  
22,826 inseminations (FAI)

## FRAME

Height at withers (adult cow): 145 to 155 cm  
Adult cow weight: 650 to 750 kg  
Adult bull weight: 1,000 to 1,100 kg  
Young-bull carcass weight: 300 to 340 kg

## TRAITS\*

Milk yield: 8,861 kg  
Milk yield (305 days): 7,170 kg  
Fat content: 4.13 %  
Crude protein content: 3.56 %

\* Official milk recording results 2012 - Mature equivalent milk yield  
Institut de l'Élevage & FCE



## Traits and performances

The Brown (or “Brune”) breed was first brought into France in the 17th century, followed by a second stronger wave of imports into the Côte d’Or and Tarn départements in the 19th century. Today, the Chatillonnais and South-West France are the regions where the Brown breed is most strongly rooted.

The breed originates from a dual-purpose population from eastern Switzerland but was later selected for dairy traits. It acquired a status of a specialized dairy breed but is selected to maintain its advantageous protein content.

The Brown breed gives excellent milk for cheese production, and is used on some farms to produce Epoisses, a high-quality cheese that has been rewarded with Protected Designation of Origin (Appellation d’Origine Contrôlée - AOC) since 1991.

Herd management systems vary strongly between regions: Brown breed can thrive under intensive farming system with essentially corn silage rations, and under mixed systems with cereal crops in favorable areas such as the Côte d’Or.

However, commonly in South-Western France, the Brown breed is equally valued on smaller-scales farm holdings where it optimizes available forage to produce high-protein and high-fat milk.

This diversity in Brown breed farming systems is also observed in other countries worldwide, from Tunisia and Madagascar to the Ivory Coast, Martinique and South-Africa, where the breed is popular due to its ability to withstand hot climates and drought conditions.

Other countries such as the USA, Canada, Switzerland, Germany and Italy all have intensive breeding programs targeting milk productivity.

## Selection

The main objectives set by the French Brown breeding program, BGS CREATION, are to increase high-protein-content milk yield productivity while protecting the traits that give long productive life and good ability to optimize the on-farm fodder available.

These objectives concur with livestock farmers’ expectations: a cow offering a good performance balance, able to produce content-rich milk on low-quality forage over a higher-than-average number of lactations.

The efficiency of the breeding program is based on increasing selection pressure and decreasing generation interval. The program’s planned matings draw heavily on embryo transfer which offers extended possibilities for exploiting the genetic material of rigorously selected donor cows.

A partnership agreement between different breeding programs is set to orchestrate embryo and semen exchanges with the USA, Germany and Switzerland with the aim of diversifying the genetic stock on offer to French farmers.

## MORE

**Organisme de sélection Brune Génétique Service**  
[www.brune-genetique.com](http://www.brune-genetique.com)

**Elva Novia**  
[www.elvanovia.fr](http://www.elvanovia.fr)

**Entreprise de sélection Midatest**  
[www.midatest.fr](http://www.midatest.fr)

**Sersia France**  
[www.sersia.fr](http://www.sersia.fr)

**Races de France**  
[www.racesdefrance.fr](http://www.racesdefrance.fr)

# Jersey

## THE BREED IN FRANCE

8,856 cows  
281 farms  
4,075 cows under milk recording system  
2,081 cows recorded in the Herd Book  
7,381 inseminations (FAI)

## FRAME

Height at withers (adult cow): 128 cm  
Adult cow weight: 430 kg  
Young-bull carcass weight: 250 to 350 kg

## TRAITS\*

Milk yield: 6,155 kg  
Milk yield (305 days): 5,176 kg  
Fat content: 5.47 %  
Crude protein content: 3.97 %

\* Official milk recording results 2012 - Mature equivalent milk yield  
Institut de l'Elevage & FCE



## Traits and performances

Originally imported from the Channel island of Jersey as far back as the 16th century, today's French-line Jersey cow is essentially clustered into a breed nucleus in western France.

Jerseys produce astonishingly high milk yields given their small size, **but what really makes them so popular is the unbeatably high milk fat and protein content, which returns better price-per-litre value and a milk that has special utility in cheese production.**

The Jersey also stands out in terms of its efficiency in converting rough feed mass into valuable milk solids (fat and protein). Note that when standard milk production is measured per hectare of forage area, the Jersey rivals even the Holstein.

**The Jersey is also popular due to other qualities, such as its long productive life.** The length of the front udder attachment and a powerful suspensory ligament combine to give the udder a good strong hold over productive life. Resilient hooves and strong-boned legs lead to low reform rates due to feet & legs issues.

Finally, the Jersey has a **good fertility** (and a very good track record in terms of non-return rate to first service), and **its gentle nature** makes for easy breeding and handling.

This set of qualities has made the Jersey a popular breed around the world, particularly in North America, Denmark, Australia and New Zealand.

## Selection

Every year, Jersiaise France works together with Gen'France to select among bulls indexed in the USA, Canada, and Denmark, and occasionally extending out to Australia or New Zealand too.

Gen'France then imports and stores semen from the selected bulls.

The bulls' catalog gives farmers a broad panel of options to cover the range of farming needs while at the same time nurturing the breed's most popular recognized traits (dense milk content, milk yield output, udder morphology).

## MORE

Organisme de sélection Jersiaise France  
[www.lajersiaise.fr](http://www.lajersiaise.fr)

Gen'France  
[www.genfrance.com](http://www.genfrance.com)

Races de France  
[www.racesdefrance.fr](http://www.racesdefrance.fr)

# Montbéliarde

## THE BREED IN FRANCE

631 380 cows  
19,671 farms  
415,552 cows under milk recording system  
256 510 cows recorded in the Herd Book  
480,050 inseminations (FAI)

## FRAME

Height at withers (adult cow): 145 to 150 cm  
Adult cow weight: 650 to 800 kg  
Adult bull weight: 1,000 to 1,200 kg  
Young-bull carcass weight: 350 to 380 kg

## TRAITS\*

Milk yield: 8,379 kg  
Milk yield (305 days): 7,209 kg  
Fat content: 3.86 %  
Crude protein content: 3.42 %

\* Official milk recording results 2012 - Mature equivalent milk yield  
Institut de l'Élevage & FCE



## Traits and performances

The Montbéliarde breed has been selected for its dairying aptitudes since the nineteenth century, in close relation with traditional village-scale cooperatives producing cheeses. The breed developed in its native Franche-Comté region before spreading out into all the French upland areas. It currently ranks 2nd French dairy breed in terms of national cattle stock numbers.

The outstanding quality of Montbéliarde breed is the balance of its production output. It gives the best fat-to-protein ratio of all the leading French dairy breeds, yielding milk that is ideally suited to cheesemaking.

This quality has enabled the Montbéliarde to earn its place in a large array of Protected Designation of Origin (Appellation d'Origine Contrôlée – AOC) cheesemaking specifications, with Comté being the most famous and the closest to its native region.

Originally bred in mountain valleys or foothills, the Montbéliarde has developed an outstanding ability to produce milk from dry on-farm forage.

The Montbéliarde's all-round balance also includes dual purpose factors. **The animals have held onto good beefing abilities (with no excess fat). Young bulls and cull cows present a good percentage yield at slaughter**, especially in plain land or cropland zones where the better feed quality enables the breed to reveal its full potential.

Its dairying qualities and functional traits (fertility, longevity, ability to thrive in a large range of temperatures) mean it has been in great demand on many export markets.

When it is crossed with local breeds, the Montbéliarde enhances their dairying and beefing potential. By crossing with specialized dairy breeds, it strengthens their functional hardiness aptitudes and increases fertility.

## Selection

The breeding objectives are defined by the Montbéliarde Selection Organization (OS), which gathers representatives from breeders, commercial farmers, breeding units, official milk recording organization, producer cooperatives and industry sectors.

The lead priority of the breeding program remains dairy production: the aim is to yield high quantities of convertible milk solids (fat but especially proteins) from forage produced on-farm, while preserving good mastitis resistance and maintaining a fairly low fat-to-protein ratio.

Next down the list are resilience-related selection criteria: as fertility is the key to cattle cost-efficiency, today's mean rate of 55% successful pregnancies with first insemination has to be consolidated or preferably improved.

Longevity is another factor addressed in the breeding program. Feet & leg and udder quality have to enable the Montbéliarde cows to go through several successive lactations complication-free.

## MORE

**Organisme de sélection Montbéliarde**  
[www.montbeliarde.org](http://www.montbeliarde.org)

**Entreprise de sélection Umotest**  
[www.umotest.com](http://www.umotest.com)

**Entreprise de sélection Jura-Bétail**  
[www.jura-betail.fr](http://www.jura-betail.fr)

**Sersia France**  
[www.sersia.fr](http://www.sersia.fr)

**Races de France**  
[www.racesdefrance.fr](http://www.racesdefrance.fr)

# Normande

## THE BREED IN FRANCE

373,699 cows  
12,295 farms  
229,635 cows under milk recording system  
79,431 cows recorded in the Herd Book  
309,161 inseminations (FAI)

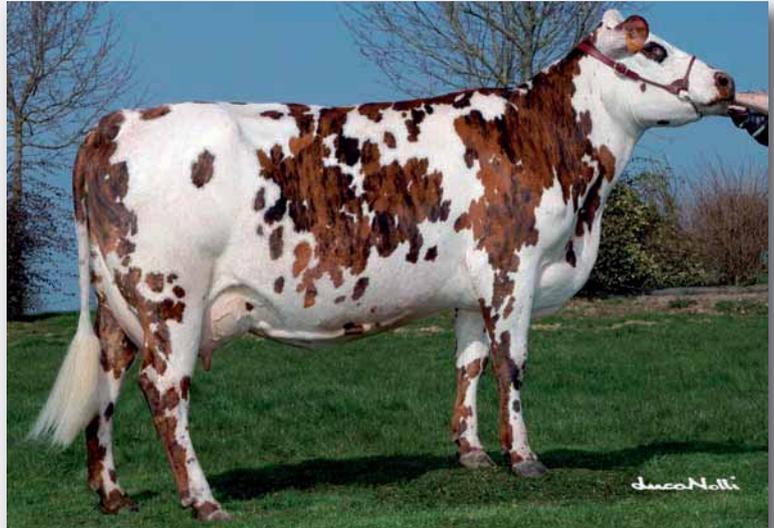
## FRAME

Height at withers (adult cow): 144 cm  
Adult cow weight: 700 to 800 kg  
Adult bull weight: 900 to 1,100 kg  
Young-bull carcass weight: 350 to 390 kg

## TRAITS\*

Milk yield: 7,927 kg  
Milk yield (305 days): 6,689 kg  
Fat content: 4.20 %  
Crude protein content: 3.61 %

\* Official milk recording results 2012 - Mature equivalent milk yield  
Institut de l'Élevage & FCE



## Traits and performances

The Normande ranks 3rd French dairy breed in terms of national cattle stock numbers. It is distributed across its native Normandy region and much of Western France.

Normande is a specialized dairy breed that produces a milk rich in milk solids, particularly protein content: it boasts the best protein yield balance of all other specialized dairy breeds, just behind the Jersey. This content-rich milk yield explains how the Normande breed has become a major contributor to such world-famous Protected Designation of Origin (Appellation d'Origine Contrôlée - AOC) cheeses as Camembert, Pont l'Évêque and Livarot.

Although genetic improvement programs have placed the accent on dairy traits, Normande calves, steers and cull cows all offer high-value percentage yield at slaughter. The carcasses present good conformation and the marbled meat holds strong market value. Indeed, a specific Normande-breed marketing system has been created (called Filière Qualité Race Normande FQRN) to certify Normande meat with a stringent set of production specifications.

In addition to these dairy and profitability performances, Normande cattle also offers good fertility (averaging 10% higher others specialized dairy breeds), always calves easily, and remains good-natured.

For over a century now, this combination of attributes has sealed the breed's excellent reputation in other countries: there are large Normande flocks in South America, especially Columbia where it thrives both as purebred and zebu crossbred.

The breed is also continuing to develop in the USA, Ireland, Germany, Portugal and parts of Eastern Europe.

## Selection

The primary objective of the Normande breeding program is to increase dairy output while maintaining the high protein yields for which the Normande breed has become famous.

However, the breeding program also features other sub-objectives: to improve functional traits (udder, feet & legs, somatic cell counts) while preserving its functional (fertility, calving ease) and beefing traits.

The breeding program, coordinated by GNA (Génétique Normande Avenir), is co-led across several Breeding companies. Since the early 2000s, the Normande is among the breeds that have benefitted from cutting-edge molecular genetics.

The genomics technologies allow to generate greater genetic progress, broader range of bulls offer and even sharper indexing on the functional traits.

## MORE

Organisme de sélection Race Normande  
[www.lanormande.com](http://www.lanormande.com)

Entreprise de sélection EVOLUTION  
[www.evolution-xy.fr](http://www.evolution-xy.fr)

Entreprise de sélection Is Normande  
[www.isnormande.fr](http://www.isnormande.fr)

Entreprise de sélection Urcecof  
[www.dynamis-geinois.fr](http://www.dynamis-geinois.fr)

Sersia France  
[www.sersia.fr](http://www.sersia.fr)

# Pie-Rouge

## THE BREED IN FRANCE

17 555 cows  
692 farms  
10,221 cows under milk recording system  
3,939 cows recorded in the Herd Book  
15,761 inseminations (FAI)

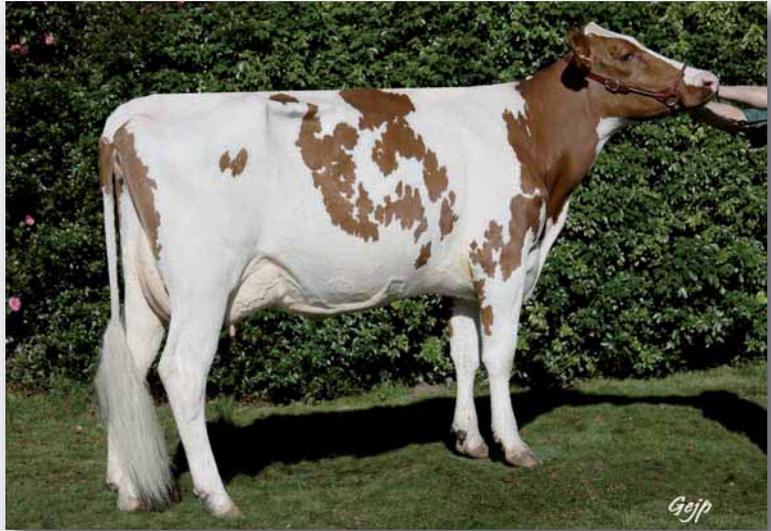
## FRAME

Height at withers (adult cow): 147 cm  
Adult cow weight: 700 to 800 kg  
Adult bull weight: 900 to 1,100 kg  
Young-bull carcass weight: 300 to 350 kg

## TRAITS\*

Milk yield: 9,252 kg  
Fat content: 4.17 %  
Crude protein content: 3.44 %

\* Official milk recording results 2012 - Mature equivalent milk yield  
Institut de l'Elevage & FCE



## Traits and performances

The Pie Rouge has a recent history in France. Originally created by crossbreeding French Armorican with German Red Pied and Dutch MRI cattle, the breed was mainly developed in the Brittany and Normandy areas.

Outside France, it thrives in the great north-western European plainland (Germany, Holland, Belgium and Luxembourg).

**French selective breeding culminated in large size animals, fairly well suited to specialized dairy farming systems.**

**Feeding a grass and corn silage-based diet will get the best out of the Pie rouge, with high milk yield and solids content.**

Other breed's quality is the fact that it offers above-average fertility while remaining easy to breed.

## Selection

**The Pie Rouge breeding program aims to preserve the breed's high milk protein yield while improving its functional breed traits (udder quality, feet & legs)**

Every year, 75 young male bulls are genotyped. Genetic evaluations are then calculated, and the results guide the selection of the 15 best animals for subsequent confirmation by progeny testing under a joint French-Polish program.

Other bulls are included to round off the livestock farmers offer through a special partnership with Germany and sales agreements with Holland, forging a system that makes the breeding program even more efficient.

## MORE

**France Pie Rouge**  
[www.pierouge.fr](http://www.pierouge.fr)

**Entreprise de sélection EVOLUTION**  
[www.evolution-xy.fr](http://www.evolution-xy.fr)

**Sersia France**  
[www.sersia.fr](http://www.sersia.fr)

**Races de France**  
[www.racesdefrance.fr](http://www.racesdefrance.fr)

# Prim'Holstein

## THE BREED IN FRANCE

2,156,210 cows  
51,608 farms  
1,687,730 cows under milk recording system  
433,969 cows recorded in the Herd Book  
2,038,149 inseminations (FAI)

## FRAME

Height at withers (adult cow): 145 cm  
Adult cow weight: 600 to 700 kg  
Adult bull weight: 900 to 1,200 kg  
Young-bull carcass weight: 290 to 340 kg

## TRAITS\*

Milk yield: 11,391 kg  
Milk yield (305 days): 9,135 kg  
Fat content: 3.87 %  
Crude protein content: 3.30 %

\* Official milk recording results 2012 - Mature equivalent milk yield  
Institut de l'Elevage & FCE



## Traits and performances

Stemming from black pied populations across the northern belt of mainland Europe (Holland, Denmark, Germany), the Holstein was developed in France from the nineteenth century on, first as the Hollandaise then the French Frisian before getting its current name in 1990.

The Holstein is the number one milk producer in France and worldwide. Holstein accounts for 30% of French national cattle stock and 60% of French national dairy stock, and produces 80% of all milk collected in France, making it the leading producer of dairy products – both in conventional farming and organic farming.

**The unparalleled attraction for Holstein stems from their milk production capacities allied with good functional traits:** udder adapted to mechanical milking, body capacity that optimizes feed intake, feet and legs that enables it to roam comfortably, pelvic conformation that makes for easy calving.

Holstein heifers grow fast and mature early, and can easily calf at just 2 years old.

Milk production of French-line Holsteins under official milk recording system jumped over 3,028 kg between 1990 and 2010, and genetic progress alone can be credited with 2/3 of this improvement. Milk protein percentage has increased by 1% over the last 20 years.

## Selection

French breeding programs, led by 4 Breeding companies, combine different objectives: the ISU global merit index combines these different criteria : production (35%), morphology (15%) and functional traits (udder health: 18 %, longevity: 5%, milking speed: 5 % and fertility: 22%).

The Holstein breed also benefits from progress in genomics research, having been enrolled in the national marker-assisted selection (MAS) program since 2001. Since 2009, there are genomic indexes on all of the traits that had previously been evaluated on progeny. Farmers in France and abroad can now benefit from this new-generation offer, allowing an accelerated genetic progress.

The international-scale Holstein breeding program highlights the key role played by French genetics: almost two out of three evaluated bulls descend from French maternal lines, and over 80% of bull dams are French.

France also holds a leading position on the international arena due to the size of its Holstein flock stock under official milk recording system (ranking it second worldwide), and to the milk performance results achieved. Almost 20,000 heifers and 1.1 million semen doses are exported every year to countries across the globe.

## MORE

**Organisme de sélection Prim'Holstein France**  
[www.primholstein.com](http://www.primholstein.com)

**Entreprise de sélection Genes Diffusion**  
[www.genesdiffusion.com](http://www.genesdiffusion.com)

**Entreprise de sélection Midatest**  
[www.midatest.fr](http://www.midatest.fr)

**Entreprise de sélection EVOLUTION**  
[www.evolution-xy.fr](http://www.evolution-xy.fr)

**Entreprise de sélection Dynamis**  
[www.dynamis-genois.fr](http://www.dynamis-genois.fr)

# Rouge flamande

## THE BREED IN FRANCE

2,060 cows  
103 farms  
777 cows under milk recording system  
624 cows recorded in the Herd Book  
1,908 inseminations (FAI)

## FRAME

Height at withers (adult cow): 135 to 148 cm  
Adult cow weight: 600 to 750 kg  
Adult bull weight: 950 to 1,250 kg  
Young-bull carcass weight: 300 to 350 kg

## TRAITS\*

Milk yield: 6 413 kg  
Milk yield (305 days): 5 685 kg  
Fat content: 3.97 %  
Crude protein content: 3.41 %

\* Official milk recording results 2012 - Mature equivalent milk yield  
Institut de l'Elevage & FCE



## Traits and performances

The Rouge Flamande is one of the oldest dairy breeds described in France, whose origin is common with shorthorns from Holland, Denmark, Angeln and Devon.

It spread across Northern France to the Paris basin, before hitting a period of decline in the 1960s.

**In contrast with many other breeds, the Rouge Flamande has always been a dairy specialized breed, even back when all cattle had to be multipurpose.**

The Rouge Flamande logically left a lasting footprint on its original birthplace in the French Nord and Pas-de-Calais, where its milk has forged several regional cheeses (Bergues, Maroilles and Vieux-Lille, among others).

This large-framed breed is currently experiencing resurgence in popularity, due to its adaptability to its home-region conditions and its highly protein-rich milk. Producers have leagued together to earn an Protected Designation of Origin (Appellation d'Origine Contrôlée – AOC) for the Bergues cheese, which is produced from Rouge Flamande milk.

In addition to its dairy production, the Rouge Flamande also produces high marketable veal calves due to their good percentage yield at slaughter and a stand-out breed-specific dense beef that has high added-value for sector professionals.

## Selection

Breed selection objectives for Rouge Flamande essentially hinge on two lead criteria: productivity, where the target is to improve both milk quantity and protein yields, and morphology, where the aim is to preserve the large frame while improving udder quality.

The Danish Red, which had a long history of being crossed in to add genetic diversity to the bloodlines and improve dairy traits, is now used more sparingly.

All the bulls enrolled into the progeny-testing program are of French maternal parentage, the aim being to reduce the Danish blood ancestry currently carried down to about 25%.

Today, the return to a breed adapted to its home region and that carries signs of quality plays to the advantage of French bloodlines that present the frame and hardiness that the market is looking for.

## MORE

**Entreprise de sélection Gènes Diffusion**  
[www.genesdiffusion.com](http://www.genesdiffusion.com)

**Ressources Génétiques Nord Pas-de-Calais**  
[www.enrx.fr](http://www.enrx.fr)

**Races de France**  
[www.racesdefrance.fr](http://www.racesdefrance.fr)

# French Simmental

## THE BREED IN FRANCE

25,477 cows  
840 farms  
16,045 cows under milk recording system  
9,427 cows recorded in the Herd Book  
23,919 inseminations (FAI)

## FRAME

Height at withers (adult cow): 140 to 150 cm  
Adult cow weight: 700 to 800 kg  
Adult bull weight: 1,000 to 1,250 kg  
Young-bull carcass weight: 350 to 380 kg

## TRAITS\*

Milk yield: 7,329 kg  
Milk yield: 6,401 kg  
Fat content: 4.00 %  
Crude protein content: 3.52 %

\* Official milk recording results 2012 - Mature equivalent milk yield  
Institut de l'Elevage & FCE



## Traits and performances

The Simmental is one of the most popular breeds in the world, counting 40 million heads worldwide. Europe uses its dual-purpose milk/beef performance abilities, whereas it features essentially used as a beef breed in the rest of the world.

Although the Simmental was originally established in the Eastern France, the last 20 years have seen it spread across the rest of the country, especially the Massif Central and the Aveyron where it produces virtually all the dairy input to Protected Designation of Origin (Appellation d'Origine Contrôlée - AOC) Laguiole cheese.

With a low somatic cell count and a good protein-to-fat ratio, Simmental milk is ideally suited to cheese industries.

Simmental owes much of its popularity to its dual-purpose: the beef output can offer farmers a whole source of incomes due to the excellent carcass yields of young bulls and the good conformation of cull cows.

Under intensive dairy farming systems, Simmentals offer content-rich milk and good percent yield at slaughter that together offset the dairy productivity.

However, it is under extensive farming systems that the Simmental really excels, as it can consume large amounts of low-quality forage yet still produce well-balanced, content-rich milk.

## Selection

The Simmental breeding program is designed to consolidate the dual-purpose profile with good dairy performances.

The improvement effort primarily focused on at least maintaining if not improving the milk content figures.

Functional traits are equally important, as fertility, longevity and somatic cell count are all breed assets that need to be conserved.

Close to a dozen bulls are subject to progeny testing every year in France, but the French offer is further enhanced by using elite bulls from breeding programs of other European countries that, like Germany, share the same beef/dairy dual-purpose selection objectives.

## MORE

Organisme et Entreprise de sélection Simmental France  
[www.simmentalfrance.fr](http://www.simmentalfrance.fr)

Races de France  
[www.racesdefrance.fr](http://www.racesdefrance.fr)

# Tarentaise

## THE BREED IN FRANCE

13,496 cows  
508 farms  
7,660 cows under milk recording system  
5,827 cows recorded in the Herd Book  
8,630 inseminations (FAI)

## FRAME

Height at withers (adult cow): 130 to 135 cm  
Adult cow weight: 550 kg  
Adult bull weight: 800 kg

## TRAITS\*

Milk yield: 5,033 kg  
Milk yield (305 days): 4,532 kg  
Fat content: 3.63 %  
Crude protein content: 3.39 %

\* Official milk recording results 2012 - Mature equivalent milk yield  
Institut de l'Elevage & FCE



## Traits and performances

The Tarentaise, also dubbed “Tarine”, descends from the French Savoie which still today is home to the majority of breedstock numbers. However, it is also found in other French upland areas, where it is well adapted to living under extensive range conditions.

In the Savoie region, Tarentaise cattle are stabled for winter and fed on hay rations, then turned out in spring to use the lower-lying Alpine valleys before climbing to higher Alpine pastureland at over 1500 m altitude where they are farmed almost exclusively on grass.

The Tarentaise produces a distinct-tasting milk used to produce four Protected Designation of Origin (Appellation d’Origine Contrôlée - AOC) cheeses (Beaufort, Tome des Bauges, Reblochon and Abondance) and two IPG cheeses (Tomme and Emmental de Savoie). Its meat also has strong consumer appeal, and their relatively slender skeleton enables a good carcass yield.

**It demonstrates excellent adaptability to tough conditions: it makes good use of rough forage, with few refusals, can comfortably withstand strong temperature variation, adjusts well to different biotopes (mountain rangeland, arid zones, tropical zones, temperate zones), adaptability to rugged conditions.**

The Tarentaise is also recognized as having an ability to cover wide distances, with little impact on milk yield productivity. The breed is also perceived as particularly hardy, with animals generally proving robust and resistant, and is recognized as easy-calving (4 out of 5 calving are unassisted), all of which ultimately translates into lower on-farm veterinary bills. Another plus point is that they are easy to breed with a long productive career.

This remarkable all-purpose blend of hardiness, milk production and beef production has carried the breed’s reputation abroad, as far afield as the USA, Canada, and North Africa (especially Tunisia and Egypt).

## Selection

The Tarentaise breeding program is pristine purebred, with zero infusion from any other lines.

**The objectives are to increase milk quality and quantity while improving fertility, longevity and morphology, all of which are adapted to target territory and end-product.**

Every year, 12 bulls are subject to progeny testing under the most far-reaching progeny-testing campaign of any French breed: 1 bull progeny-tested for 650 FAIs against 3,000-4,000 FAIs per bull tested for the other breeds.

The net result is that livestock farmers get a wide choice of Tarentaise progeny-tested bulls.

## MORE

**Organisme de sélection Tarentaise**  
[www.race-tarentaise.com](http://www.race-tarentaise.com)

**Entreprise de Sélection UCEAR**  
[www.ucear.com](http://www.ucear.com)

**Races de France**  
[www.racesdefrance.fr](http://www.racesdefrance.fr)

# Vosgienne

## THE BREED IN FRANCE

4,810 cows  
232 farms  
1,223 cows under milk recording system  
1,067 cows recorded in the Herd Book  
4,622 inseminations (FAI)

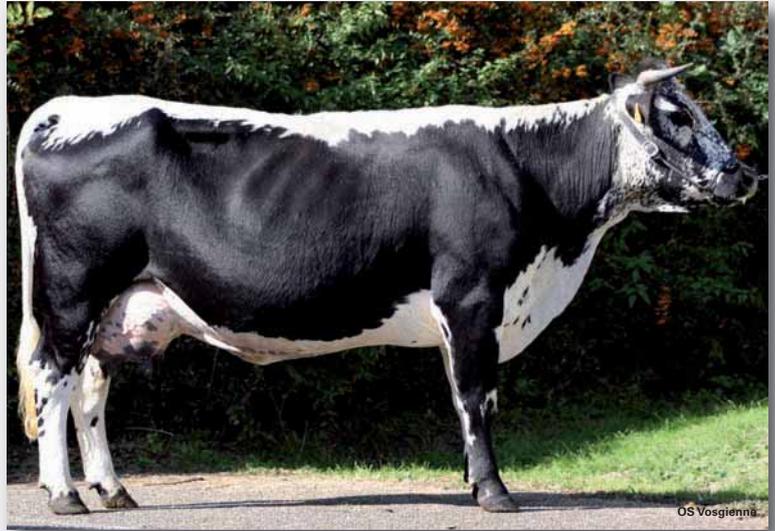
## FRAME

Height at withers (adult cow): 135 to 140 cm  
Adult cow weight: 600 to 650 kg  
Adult bull weight: 900 to 1 000 kg

## TRAITS\*

Milk yield: 4,900 kg  
Milk yield (305 days): 4,413 kg  
Fat content: 3.78 %  
Crude protein content: 3.33 %

\* Official milk recording results 2012 - Mature equivalent milk yield  
Institut de l'Élevage & FCE



## Traits and performances

Native to the Vosges upland mountains and the surrounding plainland, the Vosgienne has had to struggle through two World Wars (one of which involved combat across the breed's home turf) followed by fierce competition from breed selection initiatives that began in the 1940s.

A conservation program launched in 1977 enabled a turnaround in breed numbers, with the result that today's herd stock can build on a sound breeding population.

**The Vosgiennes presents all the characteristic traits of animals that have had to adapt to high-altitude terrain: relatively fine-boned yet well-muscled animals, well-adapted to variation in temperature and able to make good use of rough forage.**

It is a robust breed able to walk long distances, and is still moved up to summer grazing grounds from June to October on 40% of farms.

Its multi-purpose high-protein and high-fat milk is well monetized by the local Protected Designation of Origin (Appellation d'Origine Contrôlée - AOC) Munster cheese, while the meat is equally popular due to its exceptionally fine-grained structure that produces a distinctive excellent taste.

## Selection

**The Vosgienne breeding program is focused on improving the breed's milk efficiency traits (productivity, milk quality and milking speed) while preserving its dual-purpose profile and its ability to walk distances.**

The program is also closely monitoring genetic variability, using the sundial-format pedigree chart that has been kept up to date since the 1980s and is still followed by Vosgiennes breeders.

Every year, the Vosgiennes breed organization commission scouts out the farms for about thirty dams and heifers hand-picked for servicing by bulls based on their genetic value indices or their interest in terms of nurturing the genetic variability of the breed.

The offspring from these matings are further narrowed down to a dozen males sidelined for individual on-station testing on factors ranging from growth rate and carcass traits to sexual activity and morphology.

Half of this shortlist is then selected: 10,000 semen doses are then milked from each bull for progeny testing, after which 3 bulls are selected to be spread out by artificial insemination.

## MORE

**Organisme de sélection Vosgienne**  
[www.racevosgienne.com](http://www.racevosgienne.com)

**Elitest**  
[www.elitest.net](http://www.elitest.net)

**Races de France**  
[www.racesdefrance.fr](http://www.racesdefrance.fr)

# Conservation breeds



## BORDELAISE

87 cows  
31 farms  
Adult cow weight: 600 kg



## FROMENT DU LÉON

278 cows  
90 farms  
Adult cow weight: 500 kg



## FERRANDAISE

1,663 cows  
270 farms  
Adult cow weight: 700 kg

### Bordelaise

The Bordelaise was a dairy breed from the Bordeaux region that spread out to neighbouring regions from where it was used to provide Bordeaux city with fresh milk and butter.

Today, it can be equally well used for milk and beef production, where it is especially suitable for smallholdings and farm direct sales.

### Froment du Léon

The Froment du Léon breed comes from the northern Brittany coast.

As the traditional line was adapted to areas with this type of temperate climate, the Froment du Léon is not a breed for extreme temperatures.

Its slender and classy gait has earned it a nickname as 'castles breed'.

It yields a fat-rich milk that provides heavy volumes of cream noted for its deep colour and taste.

Butter from the Froment is rich in beta-carotene, and its deep primrose yellow can even reach shades of orange at certain periods of the year. This breed is well-suited to on-farm dairy processing.

### Ferrandaïse

Traditionally, the Ferrandaïse is bred in two areas of the Puy-de-Dôme département: the Chaîne des Puys and the Ambert area.

With relatively acidic-soil plateaus as its birthplace, the Ferrandaïse has evolved a lively temperament and is very robust. Docile yet full of pep, it is large-framed, strong, and a tireless worker.

Ferrandaïse milk was used to make cheeses such as Saint-Nectaire or Fourme d'Ambert.

This dual-purpose breed is now used for beef production, as its outstanding maternal qualities make it perfect for nurturing fast-growth, heavyweight veal calves showing good conformation.

### MORE

Institut de l'Élevage  
[www.idele.fr](http://www.idele.fr)

Races de France  
[www.racesdefrance.fr](http://www.racesdefrance.fr)

# Conservation breeds



## VILLARS DE LANS

398 cows  
69 farms  
Adult cow weight: 650 kg

### Villard de Lans

The Villard de Lans is native to the Lans mountain, and spread across the Vercors plateaux and mountains into the surrounding areas.

**It is spirited with a lively disposition, has a solid frame-set, and can make excellent use of rough forage.**

Its fat-rich milk is ideal for producing blue cheeses such as the Protected Designation of Origin (Appellation d'Origine Contrôlée – AOC) Bleu du Vercors-Sassenage.

The Villard de Lans has a profile that is suited to smallholdings looking to sell dairy or meat products at local scale under a quality-oriented system based on using on-farm fodder.



## BRETONNE PIE NOIRE

1,490 cows  
305 farms  
Adult cow weight: 350 to 450 kg

### Bretonne Pie Noir

**The Bretonne Pie Noir breed was shaped by the Brittany soil and climate. It developed on acidic, granitic, nutrient-poor soil which make it a hardy breed able to convert rough forage.**

This small-frame cows have excellent breeding qualities (early sexual maturity, easy calvings).

The Bretonne Pie Noir produces a highly diversified range of farm products: cream, butter, buttermilk, cheese or local-speciality milk fermented gros-lait made exclusively from Bretonne Pie Noir milk and protected under the "Gwell" label.

The Bretonne is also popular for its as subtle-tasting and tender meat.

## MORE

Institut de l'Élevage  
[www.idele.fr](http://www.idele.fr)

Races de France  
[www.racesdefrance.fr](http://www.racesdefrance.fr)



**BREEDING PROGRAMMES**

# The beef breeds selection: an unrivalled dimension

**1**

## High-performance breeds recognized among world leaders

With 10 million heads, including 3.7 million cows, France has the largest national beef herd in the European Union. France is the cradle of specialized beef breeds of worldwide renown, such as the Charolaise (1.6 million cows), the Limousine (1 million), the Blonde d'Aquitaine (530,000), the Maine-Anjou, the Parthenaise, and many others.



Beyond outstanding pure-breeds qualities, they are equally remarkable in cross-breeding to improve beefing abilities of offspring from poor conformation cows.

This offer is rounded off by breeds with impressive hardiness and maternal qualities, such as Salers, Aubrac, Gasconne, that reveal their potential particularly well under tough farm conditions.

**2**

## Rigorous and comprehensive genetic selection programs

Over the last 40 years, all of these 9 breeds have benefitted from highly effective selection programmes. The genetic selection programs combine selection of pedigree and planned mating with on-farm, on-station and post-weaning zootechnical data recording and progeny testing.



For the 3 main specialized beef breeds, on-farm and on-station evaluations are supplemented by progeny testing programs, with unrivalled dimension.

In addition to the evaluation of their beefing traits (feed efficiency, slaughterhouse results of its progeny,...), these evaluation may also take into account their maternal qualities (calving capacities, reproductive efficiency,...)

**4,2**  
million  
beef-breed  
cows

**773,000**  
purebred  
inseminated  
females (FAI)

**941,600**  
cows  
in performance  
recording

**13,000**  
bulls with  
on-farm  
performances  
evaluation

**2,290**  
bulls with  
on-station  
performances  
evaluation

**101**  
bulls evaluated  
by progeny  
testing

**50**  
bulls selected  
to be used  
by insemination

Data 2012



### 3

## Selecting for beefing abilities and maternal qualities

The selection objectives for each breed integrate calving ease and two set of core traits:

- **beefing abilities** (muscular development, growth, skeletal development, carcass yield, feed conversion efficiency)
- **maternal qualities** (fertility, longevity, reproductive efficiency, calving capacities and milking abilities)

Following each control phase (on-farm, on-station, on-progeny), a genetic value index is calculated for each trait. A global index is then calculated for the two set of core traits.

Each livestock farmer can thus choose his breeding stock according to objective criteria and the combination of qualities that is most appropriate for their targets and farm system, in France or anywhere else in the world.

### 4

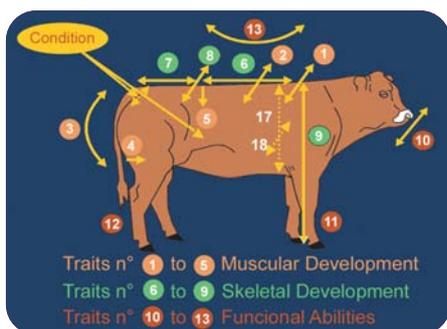
## French selection programs: an unrivalled dimension

French breeds benefit from selection programs of which scale is unrivalled worldwide:

- **on-farm performance recording**: fertility, ease of calving, calf birth weight and birthing conditions, 120-day adjusted weight and 210-day adjusted weight, morphology evaluation (muscular and skeletal development) by scoring at weaning.



In 2012, animal performance data was officially recorded for over 941,000 cows (i.e. 25% of the national herd stock), making France world leader on this topic.



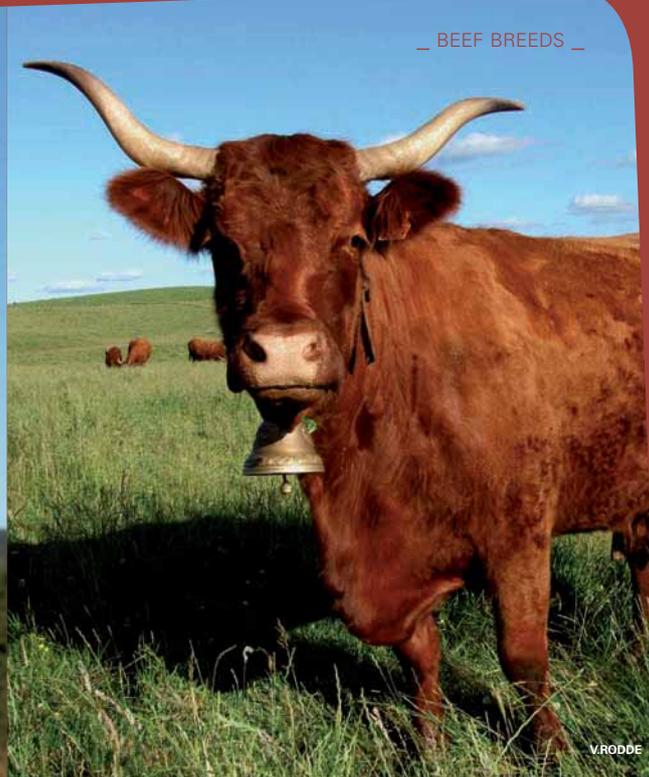
## A RIGOROUS MORPHOLOGY EVALUATION

The scoring method consists in a detailed evaluation of 19 morphology traits, all scored on a 1-to-10 scale. These morphology traits are then pooled to give muscular development, skeletal development and functional abilities (body set, muzzle width,...) overall values.

This scoring method allows a rigorous and objective evaluation of clearly defined morphology indicators. It is conducted by independent breed organization technicians, trained up by the Institut de l'Élevage and accredited for a given breed by France Génétique Elevage.



OS AUBRAC



V.RODDE

## 5

### Traceability and exploitation of slaughterhouse results

The results of these controls allow the on-farm genetic values assessment (IBOVAL genetic indexes). Qualification system shortlists the best animals in each breed, which can then be classified for subsequent career paths.

- **individual on-station testing after weaning of the best young bulls (around 2200 per year):** weighing, pelvic area measurements, feed conversion efficiency, morphological scoring,...
- **progeny testing of the best young bulls** (Charolais, Limousin and Blonde d'Aquitaine breeds) shortlisted through individual on-station testing.



Every year, around 60 bulls are assessed in terms of beefing abilities (finishing performances and slaughter results of their sons).

Similarly, around 45 bulls are assessed in terms of both bee-

ing and maternal abilities (growth, morphology, calving conditions and milking ability of their daughters in order to assess their maternal qualities).

This genetic value evaluation of the bulls' beefing abilities is then extended throughout their career integrating the slaughter results of their progeny (around 1 million young bulls per year).

Back in 1978, France was a pioneer as the first country in the world to introduce compulsory individual identification of cattle all over its territory and then full traceability.



Each cow's identification number acts as the recording basis for all that animal's data (zootechnical, genealogical, genetic, slaughter results, etc.) throughout its lifetime.

This specific feature proves yet another asset for integrating all the data needed to fine-tune the genetic indexes.

In particular, it makes it possible to annually re-update the genetic value indexes of each bull according to the slaughterhouse results (carcass weight and conformation) of its progeny.



GROUPE GASCON

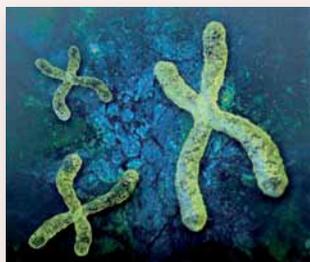


FRANCE BLONDE D'AQUITAINE

## 6

### Breakthroughs in genomics set to open new perspectives

France was one of the first countries in the world to gain official international validation from Interbull on its dairy cattle breed genomics evaluation method.



French beef cattle breed selection programs are on the verge of sealing these same benefits as the method is adapted to accommodate the breed reference population sizes and the number of animals under animal performance data recording system.

The cutting-edge technological and scientific research programs currently underway will also make it possible to extend the genomics-based evaluations to encompass meat quality criteria that conventional selection programmes are incapable of integrating, such as tenderness, marbling, flavour, and more.

As is the case with dairy cattle, the next generation of breed sires will not be marketed until these genomics-enhanced evaluations gain proven reliability, international acceptance and recognition. These are the basic condition to achieve our quality expectation.

## 7

### Convincing and recognised results

All animal performance recording (on-farm and on-station; individual and progeny testing) and all processes that dictate the quality of the results are subjected to a full battery of independent audits and a Quality Management System.

The stringency of this quality policy has gained international recognition, enabling France Génétique Elevage to obtain the ICAR (International Committee for Animal Recording) Quality Certificate.



French genetic improvement programs offer a range of beef cattle breeds selectively bred to the highest standards and spanning a broad panel of zootechnical abilities to cover the full range of livestock farmer objectives, farm system conditions and industries

expectations worldwide. Ten-year techno-economic follow-up on beef cattle farms has demonstrated that using bulls and semen from French genetic selection programs brings a 15%-plus increase in profit.

The various French breeds, chosen by farmers for their beefing or maternal qualities, are used in over 80 countries, whether purebred or cross-bred.



# Aubrac

## THE BREED IN FRANCE

163,741 cows  
4,906 farms  
59,572 cows under on-farm official performance recording system  
35,367 cows recorded in the Herd Book  
11,975 inseminations (FAI)

## FRAME

Height at withers (adult cow): 125 a 130 cm  
Adult cow weight: 580 to 780 kg  
Adult bull weight: 900 to 1,300 kg

## TRAITS

Calving unassisted or with easy assistance\*: 97 %  
Birth weight of male calves: 39.2 kg  
120-day weight of male calves: 168 kg  
210-day weight of male calves: 276 kg  
Weight of young-bull carcass: 360 to 380 kg  
Carcass yield: 56 to 58 %

\* Results of on-farm performance recording system 2012  
Institut de l'Élevage & FBC



## Traits and performances

The rugged moors and tough climate of its native Aubrac region, a highland zone of the mountainous southern Massif Central, forged the Aubrac breed. **The breed adapted to these local conditions by developing exceptional hardiness: resistance to temperature swings, strong feet & legs enabling it to roam far and wide...**

The Aubrac makes optimal use of the natural forage available on the farm, dieting on hay in winter and grazing grass in summer as it climbs to mountain pastures at over 1,000 m in altitude.

Part and parcel of this hardiness is excellent maternal qualities: virtually all calvings are successful unassisted, meaning farmers never lose sleep.

**The Aubrac's dairy origin enables it to suckle perfectly its calf.** Yet only a few dairy lines are kept today, the breed was at the root of the prestigious Laguiole cheese, with Protected Designation of Origin (Appellation d'Origine Contrôlée – AOC).

The robust calves are quick to follow their dam up to the mountain pastures, before being sold in autumn as 8 to 9-month-old weaned calves or semi-finished 12-to-15 month-old steers. Cows culled at under 10 years of age bring added value through the Label Rouge "Boeuf Fermier Aubrac - Race Aubrac", which is a set of free-range grass-fed beef specifications applying exclusively to transhumance-driven systems.

**However, the Aubrac's breed qualities are such that it can also be used to produce calves by crossbreeding with Charolais bulls.** An option that is widely exploited (accounting for 40% of calvings today) but also kept to reasonable proportions so as not to undermine the genetic value of the purebred population stock. The best crossbred heifer calves can be marketed under the "Fleur d'Aubrac" brand with Protected Geographical Indication (IGP).

## Selection

The breeding program has set its objectives around two priority breed improvement strands: **conserving the Aubrac dam's maternal traits and intrinsic hardiness** (calving ease, suckling and nursing ability, longevity, ability to convert rough forage, feet & legs) **while allowing the production of high-value low-input fattening calves** (individual growth rates, conformation).

To achieve these goals, the breeding program has integrated an advanced set of high-performance tools: annual indexes calculated based on performance records, breeding organization assessors making twice-yearly follow-up visits to breeders, individual on-station testing of the best young bulls to propagate only improved animal genetics.

The breedplan scheme also integrates state-of-the-art animal genotyping, especially to screen and regulate the double-muscling gene in propagated bulls.

## MORE

**Organisme de sélection Aubrac**  
[www.race-aubrac.com](http://www.race-aubrac.com)

**Entreprise de sélection Midatest**  
[www.midatest.fr](http://www.midatest.fr)

**Sersia France**  
[www.sersia.fr](http://www.sersia.fr)

**Races de France**  
[www.racesdefrance.fr](http://www.racesdefrance.fr)

# Bazadaise

## THE BREED IN FRANCE

3,398 cows  
142 farms  
1,859 cows under on-farm official performance recording system  
598 cows recorded in the Herd Book  
1,294 inseminations (FAI)

## FRAME

Height at withers (adult cow): 140 cm  
Adult cow weight: 750 to 850 kg  
Adult bull weight: 900 to 1,200 kg

## TRAITS

Easy calving: 93 %  
Birth weight of male calves: 41.4 kg  
120-day weight of male calves: 160 kg  
210-day weight of male calves: 246 kg  
Weight of young-bull carcass: 450 kg  
Carcass yield: 61 to 63 %

\* Results of on-farm performance recording system 2012  
Institut de l'Élevage & FBC



## Traits and performances

The Bazadaise gets its name from its native home region: Bazas, in the Gironde. Originally a draft breed, the Bazadaise progressively grew out of the Gironde and up to the Pyrenees, and is now mainly used to produce suckling veal and young bulls.

It has gained a reputation for producing fine-flavored, well-marbled meat, and the skilled know-how of Bazadaise farmers is recognized through several official-recognized quality labelling schemes: from the Label Rouge "Free-range suckling veal" for veal calves to Label Rouge "Bœuf de Bazas" and "Bœuf de Chalosse" for bulls, heifers and cows. There is also a Bazadaise breed CQC certification (Certified Quality Criteria) dubbed "La signature du groupement des éleveurs" [farmers group signature beef].

**In addition to its beefing abilities, the Bazadaise also demonstrates excellent adaptability to all types of terrain, especially rugged mountain range where it makes excellent use of rough forage.**

Bazadaise cows have a good wide pelvic area and birth relatively small calves (35 to 42 kg), all of which makes for very easy calving.

**Their good conformation, fine-boned frame and good finishing abilities have created appeal on the export market.**

The Bazadaise breed can now be found in England, Belgium, Spain, Switzerland, South America and Australia. It can be used to bring conformation and faster growth rates to local breeds while maintaining easy calving.

## Selection

The Bazadaise Herdbook, which was established in 1896, has managed to keep the breed's pure pedigree while improving its natural traits. In 2008, the Breeding organization Excellence Bazadaise took over, and working in partnership with Breeding Company Midatest, a stringent selection and in-breeding management program was introduced.

**This program revolves around individual on-station performance testing on around 20 male weaned calves every year, all descended from a set of dams under on-farm official performance recording system, that form the breeding population pool.** The best young bulls qualified on-station are sold on at two auctions held every year.

Every year, 1 or 2 bulls are selected to be propagated by artificial insemination: 27 bulls are currently on the artificial insemination catalogue and the farmers receive advice to help them manage the genetic variability and performances of their flocks.

Excellence Bazadaise is also involved in beef-breed genomics research under the French GEMBAL program (multi-breed genomics program for dairy and beef-breeds).

## MORE

**Organisme de sélection Excellence Bazadaise**  
[www.bazadaise.fr](http://www.bazadaise.fr)

**Entreprise de sélection Midatest**  
[www.midatest.com](http://www.midatest.com)

**Sersia France**  
[www.sersia.fr](http://www.sersia.fr)

**Races de France**  
[www.racesdefrance.fr](http://www.racesdefrance.fr)

# Blonde d'Aquitaine

## THE BREED IN FRANCE

558,374 cows  
18,424 farms  
161,558 cows under on-farm official performance recording system  
35,929 cows recorded in the Herd Book  
131,028 inseminations (FAI)

## FRAME

Height at withers (adult cow): 145 to 160 cm  
Adult cow weight: 850 to 1350 kg  
Adult bull weight: 1,100 to 1,700 kg

## TRAITS

Easy calving: 93 %  
Birth weight of male calves: 47,3 kg  
120-day weight of male calves: 182 kg  
210-day weight of male calves: 301 kg  
Weight of young-bull carcass: 400 to 460 kg  
Carcass yield: 61 to 63 %

\* Results of on-farm performance recording system 2012  
Institut de l'Élevage & FBC



## Traits and performances

The Blonde d'Aquitaine was created in 1962 by combining the three branches of south-western French Blonde line-breeds, and its numbers have since spiraled: **in the space of just 30 years, it has progressed from regional breed to national breed and is now fast becoming an international breed.**

The popularity of the Blonde d'Aquitaine stems from a combination of attractive factors: a large frame yet very docile breed that calves easily by birthing slender fine-boned calves.

**The animals consistently demonstrate top-notch conformation and outstanding growth, but the primary advantage that really sets the Blonde d'Aquitaine apart is its remarkably high percentage yield of high-value carcass.**

Experience has shown that the fine bone structure and low percentage of body fat mean higher cutability, especially of high-value cuts (hindquarters) which average out at 5% higher yields than the best-of-the-rest specialized beef breeds.

The Label Rouge "Bœuf Blonde d'Aquitaine" was created in 1992 to promote sales of lean and tasty Blonde meat.

Beyond these qualities, **the Blonde d'Aquitaine also offers a strong ability to withstand hot climates and drought conditions**, which have sealed its popularity in countries like Mexico, Peru, and Columbia, where it is widely crossed with zebu.

Blonde blood brings earlier growth, better conformation and improved carcass yields to native local breeds.

## Selection

The best Blonde d'Aquitaine young bulls are evaluated in the national individual on-station testing in Casteljalous, as part of the genetic improvement program led in tandem by France Blonde d'Aquitaine Sélection, Blonde Génétique and the Breeding Company Midatest.

The breeding objectives are revised every ten years to realign them with farmers' needs and expectations. The Blonde d'Aquitaine breeding program is currently working on cross consolidating the different productive objectives (purebred or crossbred) while preserving the breed's excellent traits.

**The priority objectives are therefore to increase beef yields (muscle development) and improve suckling ability while conserving the breed's frame, growth rate and ease of calving.**

The quality of the bulls propagated by artificial insemination - for their beefing abilities or their maternal qualities - together with the broad range of qualified bulls for natural mating are driving the improvement campaign forward.

## MORE

**France Blonde d'Aquitaine Sélection**  
[www.blonde-aquitaine.fr](http://www.blonde-aquitaine.fr)

**Entreprise de sélection Midatest**  
[www.midatest.com](http://www.midatest.com)

**Sersia France**  
[www.sersia.fr](http://www.sersia.fr)

**Races de France**  
[www.racesdefrance.fr](http://www.racesdefrance.fr)

# Charolaise

## THE BREED IN FRANCE

1,575,600 cows  
36,040 farms  
375,443 cows under on-farm official performance recording system  
124,325 cows recorded in the Herd Book  
425,938 inseminations (FAI)

## FRAME

Height at withers (adult cow): 135 to 150 cm  
Adult cow weight: 700 to 1 200 kg  
Adult bull weight: 1,000 to 1,650 kg

## TRAITS

Easy calving: 90 %  
Birth weight of male calves: 48.1 kg  
120-day weight of male calves: 182 kg  
210-day weight of male calves: 301 kg  
Weight of young-bull carcass: 390 to 440 kg  
Carcass yield: 59 to 61 %

\* Results of on-farm performance recording system 2012  
Institut de l'Élevage & FBC



## Traits and performances

Charolaise is the leading French beef breed. It originated in what is today the Saône-et-Loire département in Bourgogne, from where it spread out across the rest of France.

Bred in the 19th century in the lush pastures of the Charolaise region and the Nivernais plains, **the Charolaise developed tremendous growth ability and excellent conformation, producing heavy carcasses.** The Charolaise Herd Book was established back in 1864, and breeders have progressively selected for and improved these traits ever since.

**Today, the Charolaise is reputed for its absolutely outstanding feed efficiency and its strong maternal qualities:** it produces more milk than any other specialized beef breed, meaning that Charolaise dams can meet all their calves' suckling needs and enable male calves to gain at least 1,200 g a day in live-weight.

**The Charolaise makes good use of all types of forage, and this, combined with a docile disposition,** make it readily adaptable to fit into most livestock systems - whatever the geography.

It is therefore highly prized for all-purpose cross-breeding, not just in France but also abroad: Charolaise breed is present in 70 countries worldwide, and has even fathered brand-new breeds such as the Charbray (a Charolais x Brahman cross) or Canchim (a Charolais x Zebu cross).

## Selection

The production objectives for the Charolaise breed are to target one calve per cow per year by unassisted calvings and to produce top-quality saleable carcasses with little excess fat, while conserving the breed's intrinsic natural growth ability and beefing conformation, which are its flagship assets.

**A cutting-edge qualification program identifies and propagates the animals that best fit the target objectives.** This program is built on a baseline breeding population of 136,880 cows held by Charolais Herd Book (HBC)-affiliated breeders, with full-scale performance records: only 35% of active cows manage to qualify under this stringent framework.

On-farm performance recording on the offspring of these dams are used to select the highest-quality weaned calves for subsequent on-station performance testing. Around 450 young bulls come through with the status "qualified bulls", and will be propagated at the farms for natural mating.

**The breeding program also relies on progeny testing: around 40 bulls shortlisted are tested for their Beefing Abilities ('AB') or Maternal Qualities ('QM') by tracking their offspring through on-station or on-farm performance records.** Other bulls may be tested for calving ease and early muscling.

## MORE

**Organisme de sélection Charolais France**  
[www.charolaise.fr](http://www.charolaise.fr)

**Entreprise de sélection Gènes Diffusion**  
[www.genesdiffusion.com](http://www.genesdiffusion.com)

**Entreprise de sélection UCATRC**  
[www.ucatrc.com](http://www.ucatrc.com)

**Sersia France**  
[www.sersia.fr](http://www.sersia.fr)

**Charolais Expansion**  
[www.charolais-expansion.com](http://www.charolais-expansion.com)

# Gasconne

## LATHE BREED IN FRANCE

19,065 cows  
642 farms  
8,430 cows under on-farm official performance recording system  
6,391 cows recorded in the Herd Book  
1,695 inseminations (FAI)

## FRAME

Height at withers (adult cow): 135 cm  
Adult cow weight: 650 to 750 kg  
Adult bull weight: 900 to 1,150 kg

## TRAITS

Easy calving: 99 %  
Birth weight of male calves: 39 kg  
120-day weight of male calves: 162 kg  
210-day weight of male calves: 247 kg  
Weight of young-bull carcass: 340 to 380 kg  
Carcass yield: 56 to 58 %

\* Results of on-farm performance recording system 2012  
Institut de l'Elevage & FBC



Groupe Gascon

## Traits and performances

The Gasconne is native to the steep hillsides and mountainous slopes of the Pyrenees. It is now used for its widely-recognized hardiness and outstanding maternal traits.

**The quality of its hooves and the solidity of its feet & legs enable the Gasconne to graze all types of rangeland, even on the sharpest slopes. Furthermore, its short and densely-knit coat combined with black-rimmed eyelids make it extremely resistant to extreme variations in temperature.**

Pair these qualities with unquestioned calving ease and an ability to accept changes in diet, and you have the best combination of breed traits possible for grazing high-altitude summer pastures, although the Gasconne is equally able to make optimal use of richer rations under plainland or lowland systems.

**The Gasconne breed is essentially used to produce weaned calves that are sold for fattening after summering on the high-altitude pastures, in a farming system that carries only minimal production costs.** Farming systems that do not turn out to pasture can still use grass or silage rations to produce different types of saleable animals.

Gasconne-breed value is recognized through a series of collective product brands or officially-recognized quality labels: collective brands like "Race Gasconne", "Cadet Gascon" or "Rosée des Pyrénées".

Organizing the Gasconne market into specific sales channels has been a major triggering factor in extending the breed's geographic range over the last few years. In France, the Gascon is now found in 74 départements, including French Guiana and Martinique in tropical areas. Elsewhere, the Gasconne is found across the rest of Europe (especially Spain, which counts a 5000-cow breed nucleus), but also the Czech Republic and as far afield as Chile and Ecuador.

## Selection

The core objectives of the breeding program are hardiness and reproductive efficiency, plus improving growth potential, morphological traits and beefing abilities.

In order to drive a Gasconne breeding program targeting both maternal qualities and beefing abilities, Groupe Gascon - which acts as both Breeding Organization and Breeding Company - has set up a cutting-edge breed development centre.

This centre provides a platform covering the needs of both natural mating and artificial insemination (70 bulls), top-quality heifers (a nursery of 100 dams), plus an experimental station that hosts a cattle fattening unit run to Label Rouge standards.

The breeding program has also integrated genomics technologies, such as mh gene (muscular hypertrophy) genotyping to regulate the breed's double-muscling gene.

## MORE

**Organisme et Entreprise de sélection Groupe Gascon**

[www.gasconne.com](http://www.gasconne.com)

**Entreprise de sélection Midatest**

[www.midatest.fr](http://www.midatest.fr)

**COOPELSE**

[www.coopelso.fr](http://www.coopelso.fr)

**Sersia France**

[www.sersia.fr](http://www.sersia.fr)

**Races de France**

[www.racesdefrance.fr](http://www.racesdefrance.fr)

# Limousine

## THE BREED IN FRANCE

1,076,000 cows  
26,786 farms  
244,800 cows under on-farm official performance recording system  
72,753 cows recorded in the Herd Book  
145,001 inseminations (FAI)

## FRAME

Height at withers (adult cow): 135 to 145 cm  
Adult cow weight: 650 to 850 kg  
Adult bull weight: 1,000 to 1,300 kg

## TRAITS

Easy calving: 98 %  
Birth weight of male calves: 42.9 kg  
120-day weight of male calves: 177 kg  
210-day weight of male calves: 289 kg  
Weight of young-bull carcass: 375 to 420 kg  
Carcass yield: 60 to 62 %

\* Results of on-farm performance recording system 2012  
Institut de l'Élevage & FBC



France Limousine Sélection

## Traits and performances

The Limousine breed was forged by its home region the Limousine, a predominantly pastureland area of France where winter conditions can prove tough. It is one of the very oldest French breeds to be selected for beefing abilities without crossing-in foreign blood.

Decades of dedicated selection efforts have now culminated in a breed that is ideally suited to meat production.

**A standout feature of the Limousine breed is its ability to produce animals that consistently hit the same level of quality, regardless of age at slaughter:** baby veal calves, calves weaned for fattening, young bull, heifers or cull cows - all equally prized by butchers and consumers alike.

**The success of these products hinges largely on the Limousine's excellent carcass yield, as its thin hide and unusually slim skeletal convert into a remarkable saleable meat yield.**

Limousine meat gains added value through three official quality labels: "Bœuf Limousin", "Limousin free-range veal", and "Limousin Junior" (all three under prestige-edition Label Rouge).

In addition to these outstanding carcass merit traits, the Limousine also boasts **excellent maternal qualities (ease of calving, dam fertility and longevity, adaptability to different farming systems).**

This perfect trade-off between farming qualities and market profitability has enabled the Limousine to extend its popularity throughout France, and to export into over 80 countries worldwide, where it is used purebred or else crossbred with local breeds to add improved meat yields.

## Selection

The breeding program, coordinated and co-managed by France Limousin Sélection and the French Limousine Herd-Book, hinges around the national bull evaluation station at Lanaud.

The breeding objectives are currently to obtain cowherds able to deliver a regular one weaned calve a year, calving unassisted, and young bulls aged 15 to 17 months with top-quality saleable meat yield (400 kg of superior grade-E conformation meat, with little excess fat).

**In order to achieve these targets, the breeding program harnesses the full panel of selection methods (parentage, progeny and individual on-station testing) with all the different ways to propagate selected breeding stocks (natural mating, AI).**

This system can thus hand-pick and propagate the very best bulls in commercial farms to ensure clear-cut genetic herd improvement. The weight differential between progeny sired by bulls registered in the Limousine Herd-Book versus unregistered bulls reach 15 to 55 kg liveweight for heifers and 20 kg liveweight for weaned calves.

## MORE

**France Limousin Sélection**  
[www.limousine.org](http://www.limousine.org)

**Interlim**  
[www.interlim.com](http://www.interlim.com)

**Races de France**  
[www.racesdefrance.fr](http://www.racesdefrance.fr)

# Parthenaise

## THE BREED IN FRANCE

42,986 cows  
1,047 farms  
20,502 cows under on-farm official performance recording system  
11,663 cows recorded in the Herd Book  
12,437 inseminations

## FRAME

Height at withers (adult cow): 130 to 135 cm  
Adult cow weight: 700 to 1 000 kg  
Adult bull weight: 950 to 1,400 kg

## APTITUDES

Easy calving: 88%  
Birth weight of male calves: 46.1 kg  
120-day weight of male calves: 165 kg  
210-day weight of male calves: 278 kg  
Weight of young-bull carcass: 380 to 420 kg  
Carcass yield: 61 to 63 %

\* Results of on-farm performance recording system 2012  
Institut de l'Élevage & FBC



## Traits and performances

The Parthenaise has originally been used to produce both milk and draft bulls in and around the Poitiers area, but its numbers plummeted in the 20th century due to competition from specialized dairy breeds and the move away from harness animals.

In the 1970s-80, the breeders engaged a genetic improvement program focused on beefing abilities, thus effectively turning the breed towards specialized beef production. This reconversion process sparked a three-fold increase in national cowherd within the space of just a decade.

The Parthenaise is suited to producing young bulls for slaughter at age between 10 and 12 months or around 14 to 16 months, but is particularly prized for producing young beef cows aged 4 to 6 years and fattened after their first two or three calvings.

The official-recognized quality Label Rouge "La Parthenaise" was obtained in 2006: animals qualifying for this value-adding label must be slow fattened and finished over at least 6 months in order to guarantee a lean, fine-flavored meat.

The high-quality meat produced goes mainly to specialized butcher channels, although there are valuable opportunities through high-end restaurants.

The overall quality of the Parthenaise has also recently generated interest in the export market, and it is now produced in Europe (UK, Ireland, Belgium, Holland, Switzerland) and the other major beef countries (Canada - USA - Mexico and Australia - New Zealand).

## Selection

The Parthenaise breeding program coordinated by the Parthenaise Breeding organization aims to improve the breed's beefing abilities without losing its maternal and functional qualities and maintaining its genetic variability.

Priority criteria are muscular development and growth (for better carcass yield) and the suckling ability of the dams (for better calve growth rates).

This improvement program therefore aims to produce males and females yielding over 400 kg of saleable carcass, rated class-U and class-E lean, while holding onto good-value functional traits.

Every year, on-station performance testing is led on the best 100 weaned males selected from across the 230 farms in the breeding population pool. Four or five bulls are then progeny-tested every year, culminating in 10 to 15 qualified bull to be propagated by AI.

## MORE

**Organisme de Sélection Parthenaise**  
[www.parthenaise.fr](http://www.parthenaise.fr)

**Entreprise de sélection EVOLUTION**  
[www.evolution-xy.fr](http://www.evolution-xy.fr)

**Sersia France**  
[www.sersia.fr](http://www.sersia.fr)

**Races de France**  
[www.racesdefrance.fr](http://www.racesdefrance.fr)

# Rouge des Prés

## THE BREED IN FRANCE

39,129 cows  
1,382 farms  
18,437 cows under on-farm official performance recording system  
7,695 cows recorded in the Herd Book  
8,929 inseminations (FAI)

## FRAME

Height at withers (adult cow): 140 cm  
Adult cow weight: 850 to 1,000 kg  
Adult bull weight: 1,000 to 1,500 kg

## TRAITS

Easy calving: 84 %  
Birth weight of male calves: 50.9 kg  
120-day weight of male calves: 188 kg  
210-day weight of male calves: 299 kg  
Weight of young-bull carcass: 420 to 470 kg  
Carcass yield: 58 to 60 %

\* Results of on-farm performance recording system 2012  
Institut de l'Élevage & FBC



## Traits and performances

Today's Rouge des Prés traces back to crossbreeding between the hardy dairy-based Mancelle cattle and the early-growing beef-based Durham. It originated from northwestern France, which even today counts 90% of Rouge des Prés flock numbers.

The Rouge des Prés was long left to evolve as a dual-purpose breed, being switched exclusively to beef production only in the 1980s, and so has held onto a good milking ability. This means that even though the breed commonly births twins, Rouge des Prés dams still suckle their calves perfectly well.

**Relatively high birth weights combined with exceptional weight gain lead to large-frame animals that feature among the heaviest breeds in the world.**

All these characteristics come through strongest in temperate-climate grassland systems, and indeed almost half the farms in the breed's home region fatten their animals under extensive systems where the animals exploit the rich plainland resources in spring and regrowth in autumn and draw on their body reserves in winter and during summer drought.

**The Rouge des Prés also excels in more intensive livestock systems, as it has the calm and quiet disposition needed to adjust to batch-managed fattening operations.**

The Rouge des Prés was long known as the "Maine-Anjou" – up until the term became sidelined for the "Maine-Anjou" beef Protected Designation of Origin (Appellation d'Origine Contrôlée – AOC) granted in 2004.

"Maine-Anjou" AOC primarily covers high-value adult cows killing out at upwards of 380 kg of carcass and beefs aged over 30 months (yielding at least 400 kg of saleable carcass). Bulls aged 36 months also have AOC labelling as exceptional specimens, killing out at over 600 kg carcass yield, i.e. 1 ton liveweight.

## Selection

The Rouge des Prés breeding program has set its objectives in line with the requirements of the Maine-Anjou AOC quality specifications: typical characteristics and home-soil ties.

**Selection-based improvement is therefore primarily turned towards maternal qualities (calving ease, early growth, suckling ability, reproductive life), and second towards beefing abilities (growth rate, feed conversion efficiency, conformation).**

Planned matings, on-station performance testing on 70 weaned male calves a year, and progeny testing on 4 bulls a year are the core strands of the breedplan selection scheme.

Planned matings and individual genotyping are also used to regulate the double-muscling gene, which is carried by the breed.

## MORE

**Domaine Rouge des Prés**  
[www.rougedespres.fr](http://www.rougedespres.fr)

**Entreprise de sélection EVOLUTION**  
[www.evolution-xy.fr](http://www.evolution-xy.fr)

**Sersia France**  
[www.sersia.fr](http://www.sersia.fr)

**Races de France**  
[www.racesdefrance.fr](http://www.racesdefrance.fr)

# Salers

## THE BREED IN FRANCE

201,572 cows  
6,028 farms  
50,983 cows under on-farm official performance recording system  
26,246 cows recorded in the Herd Book  
11,126 inseminations (FAI)

## FRAME

Height at withers (adult cow): 140 cm  
Adult cow weight: 700 to 900 kg  
Adult bull weight: 1,000 to 1,400 kg

## TRAITS

Easy calving: 99 %  
Birth weight of male calves: 38.6 kg  
120-day weight of male calves: 168 kg  
210-day weight of male calves: 272 kg  
Weight of young-bull carcass: 370 to 400 kg  
Carcass yield: 56 to 58 %

\* Results of on-farm performance recording system 2012  
Institut de l'Élevage & FBC



## Traits and performances

The Salers is native from the Auvergne region deep in the heart of the Massif Central – a tough, rough mountainous area that has forged bred-in hardiness.

**The quality of its hooves and the solidity of its legs enable the Salers to graze all types of rangeland, and its mahogany-red coat color copes with the effects of heat while its long curly winter coat offers effective protection against the cold.**

The Salers also boasts a larger pelvic area than any other breed, which enables the dams to calve easily and successfully with zero assistance. This outstanding characteristic also means that Salers can easily be crossbred with other well-muscled breeds such as Charolais without compromising this unparalleled calving ease.

**Salers makes the ideal suckling dam - a quality that stems from its dairy origins:** initially farmed as a dual-purpose breed, the quality of its milk built up a reputation through the local cheese industry, carried by big-names cheeses such as Cantal.

Today, the Salers is the only breed to boast two distinct genetic branches: the beef branch (95% of the national cowherd), and a dairy branch used to produce "Tradition Salers" cheese, with Protected Designation of Origin (Appellation d'Origine Contrôlée - AOC), which is made exclusively from Salers milk.

**Farmers in the Salers home region tend to produce heavyweight purebred or crossbred weaned calves sold in autumn after summering on the high-altitude pastures.** Note that Salers spends over 7 months at pasture and is then left to range freely, where it helps maintain the high-altitude prairieland.

Its ability to handle extreme temperature ranges combined with exceptional calving ease go far towards explaining its popularity, not just across the whole of France but also in other major extensive farming regions of the world, from the USA and Canada to Australia and Eastern Europe.

## Selection

The Salers breeding objectives are to maintain its hardiness and its maternal qualities, such as astonishing reproductive efficiency (the aim being to produce 6 or 7 calves per cow at a regular one-calf-a-year interval) while further improving growth rate and muscular potential.

In order to achieve these targets, the breeding program combines a functional pedigree Herdbook, on-farm performance recording enabling IBOVAL genetic assessments of sire bulls and dams.

**Every year, the national assessment station genetic allows to select the very best bulls to be propagated by AI and natural mating.**

## MORE

**Organisme de sélection Groupe Salers Evolution**

[www.salers.org](http://www.salers.org)

**Sersia France**

[www.sersia.fr](http://www.sersia.fr)

**Races de France**

[www.racesdefrance.fr](http://www.racesdefrance.fr)

# Conservation breeds



## ARMORICAINE

240 cows  
71 farms  
Adult cow weight: 600 kg



## BÉARNAISE

223 cows  
56 farms  
Adult cow weight: 650 kg



## CASTA

301 cows  
42 farms  
Adult cow weight: 600 kg

### Armoricaïne

The Armoricaïne derives from a 19th-century cross between the large-frame Bretonne Pie Rouge and the English Durham or Shorthorn breed. Frugal and hardy, yet gentle-natured, the Armoricaïne is relatively low-maintenance and is unaffected by colder climates.

Originally a dual-purpose beef/dairy breed, today's **Armoricaïne is primarily used for beef**. It fattens fast and early on, to the point that breeders need to keep a watch on heifer diet intake to make sure they do not get too fat before their first mating.

### Béarnaise

The Béarnaise gets its name from its native home region. **This mountain-farmed breed calves easily, and has remained well adapted to climbing to the summer pastures: hardy, agile and physically athletic, it is ideally geared to searching out new grazing areas.**

Although originally a dairy breed, it is mainly used to produce white or rose veal calves, whose relatively slender skeletal gives a good yield of saleable meat.

### Casta

The Casta breed traditionally spanned the entire central Pyrenees. **This relatively lively medium-sized breed has slender yet strong-boned feet & legs on very tough black hooves enabling it to prosper on all types of terrain.**

It was traditionally milked, and served to produce Bethmale cheese. Although Casta flocks today tend to be used in beef systems, the breed has maintained an ability to produce nutrient-rich milk, which combined with a very strong mothering instinct, makes it an excellent feeder dam.

**MORE**

Institut de l'Elevage  
[www.idele.fr](http://www.idele.fr)

# Conservation breeds



## MARAÎCHINE

1,266 cows  
70 farms  
Adult cow weight: 650 kg

### Maraîchine

Native of the French Atlantic coast in a marshland area running estuary-to-estuary from the Loire to the Gironde, the Maraichine is a large framed breed with a well-developed skeleton.

The Maraichine was re-introduced into this marshland rangeland as a conservation measure, enabling the breed to exploit its unusual ability to use this highly specific plant diet and quickly recover after periods of neglect.

The Maraichine is the perfect partner for farmers working with farm systems that are based on tightly controlled management over humid pastureland regions.



## MIRANDAISE

522 cows  
79 farms  
Adult cow weight: 700 kg

### Mirandaise

The Mirandaise is the traditional native Gascon breed from the Gers département. **The very tough livestock farming conditions found in the Gers upland slopes have made it undemanding, with an ability to withstand hot climates.**

That said, the Mirandaise remains a relatively large breed, producing fast-fattening animals.

Farmers are currently coordinating their efforts in order to kick-start the production of white veal and the 4 to 5-year-old Mirandaise beefs known locally as "Nacrés de Gascogne".

**MORE**

Institut de l'Elevage  
[www.idele.fr](http://www.idele.fr)

# Conservation breeds



## NANTAISE

864 cows  
105 farms  
Adult cow weight: 650 kg



## SAOSNOISE

1,546 cows  
85 farms  
Adult cow weight: 800 kg



## LOURDAISE

259 cows  
57 farms  
Adult cow weight: 650 kg

## Nantaise

The Nantaise is a medium-sized cow breed that demonstrates good adaptability and grows equally well foraging dry or humid rangeland where it is able to exploit ligneous and low-quality roughage.

**These robust yet gentle-natured and easy-calving cattle make easy livestock to work with.**

It is an outstanding breed for producing white or rose veal, as Nantaise cows are very good suckling dams and their calves are slender-boned yet well-muscled.

## Saosnoise

The Saosnoise was originally developed in the northern Sarthe from the Mancelle breed by outcrossing with Durham, Normande and later Maine-Anjou blood.

**This heavy-grazing and heavy-framed breed is easy-going and readily adapts to variations in temperature and prolonged periods of rain and damp.**

Despite being visibly massive, the Saosnoise has kept a relatively fine-boned frame. Thus, the breed is able to produce high-percentage-yield young bulls or cow carcasses.

## Lourdaise

Back in the past, when the Lourdaise was used for milk, it boasted a reputation as the best dairy producer of all the Pyrenean breeds. Now, though, it is used exclusively for beef meat.

**The best dairy lines may well have disappeared, but Lourdaise dams still have the milk potential to produce good white or rose veal calves that generally offer profitable conformation.**

Docile and sociable, its popularity with farmers is further enhanced by the fact that it comfortably adapts to life on high-altitude pastures.

## MORE

Institut de l'Élevage  
[www.idele.fr](http://www.idele.fr)



GEODE

**BREEDING PROGRAMMES**

# The meat sheep breeds selection: quality in the diversity

1

## More than 20 specialized or hardy breeds

With a high-range genetic potential of more than 3.8 million sheep, France is one of the European leaders in sheepmeat production.

**More than 10 specialized meat breeds** (Ile de France, Charollais, Berrichon du Cher, Rouge de l'Ouest, Vendéen, to name but a few) or prolific breeds (Romane ex-INRA 401) offer added value traits, whether purebred or crossbred.

Additionally, more **than a dozen rustic breeds** (Causse du Lot, Blanche du Massif Central,



Préalpes du Sud, Lacaune viande, etc.) allow for a wide range of choices when targeting optimized breed-harsh environment pairs.

2

## A know-how, result of a long experience

**Genetic improvement of all these breeds relies on constantly improving selection programs, initiated as soon as the 60s and continually upgraded.** These programs



generated a very high genetic quality reproductive stock meeting the requirements of all those involved in the sector.

They include a wide on-farm performance data recording system and a male brood stock evaluation system.

**These programs cover both specialized meat breeds and hardy breeds** and include individual electronic identification, pedigree selection, ancestry controlled by genotyping, planned mating, on-farm performance data recording and then on-station performance data recording. The best rams of specialized meat breeds and of some hardy breeds are then evaluated by progeny testing to get a clearance for use in A.I.

**3.8**

million meat-breed ewes

**296,100**

ewes under on-farm data performance recording

**162,000**

inseminated female (FAI)

**3,600**

rams with on-station data performance evaluation

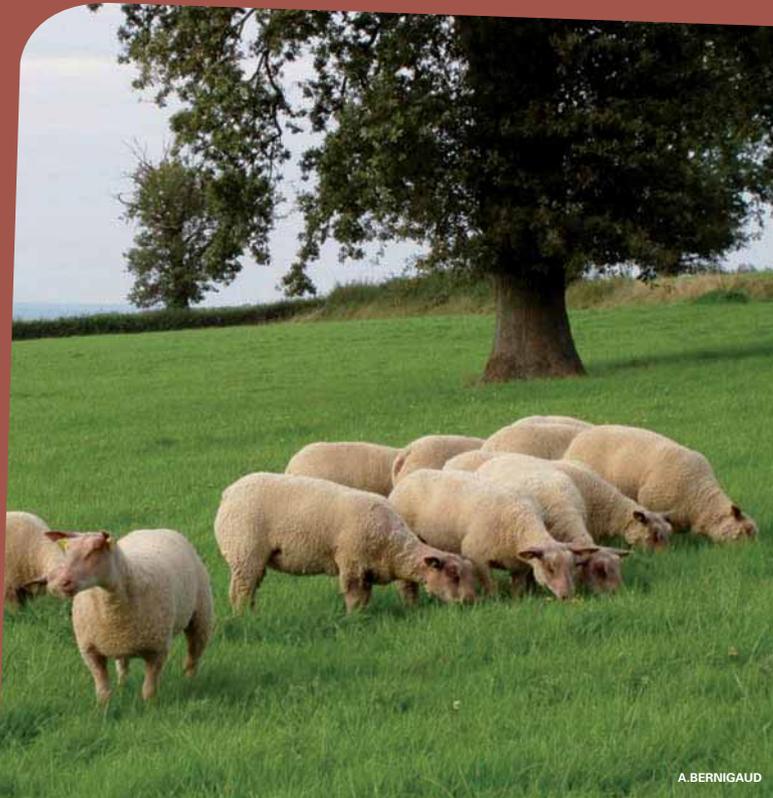
**267**

rams evaluated by progeny testing

**100**

rams selected to be used by insemination

Données 2012



A. BERNIGAUD



CORAM

### 3

## A comprehensive on-farm data performance recording system



More than 296,000 ewes in 1,200 herds are under official on-farm data performance recording system. The controls provide data on reproduction (lineage, mating declaration, prolificacy), on milking abilities (lamb weight at 30 days) and growth (lamb weight at 70 days).

Parentage controls by genotyping, conducted by random sampling, reinforce this national system. The continued integration of technological innovations ensures an efficient and methodical recording of zootechnical data, guaranteeing the reliability of genetic evaluations.

### 4

## A rigorous selection by on-station data performance control

After on-farm data performance recording, the best 2,500 best rams are evaluated on-station for performance data monitoring and recording. They are the result of carefully planned and genotyped mating,



between rams already evaluated by progeny testing and the 20% best dams in the racial population ("ram dams").

During 2 months, these young rams are rigorously controlled (growth rate, age-type weight, conformation,...), including for specialized meat breeds ultrasound measurements of muscle development and fat level.

After elimination of the 20% lowest-performers, the young rams are qualified as "Recommended" and released for natural mating.



## AN EFFECTIVE GENOMIC SELECTION TO FIGHT THE SCRAPIE.

Between 2002 and 2008, more than 670,000 genotypes analysis were used to develop a specific genomic selection strategy to fight the scrapie.

The results command attention. Since 2008, thanks to the systematic elimination of rams carrying AHQ or VRQ susceptibility alleles of the PrP gene, no farm in the breeding population bases carries the VRQ hyper susceptibility allele. Furthermore, over 95% of them are scrapie-resistant (ARR/ARR genotype).



CORAM

5

### Progeny testing of the best rams

Each year, the top 200-250 rams of specialized meat breeds and of some hardy breeds (Blanche du Massif Central, Lacaune Viande) are subject of progeny testing, to evaluate precisely their beefing abilities.



The progeny testing for beef traits include on-farm and fattening data performance recording of thirty lambs for every tested ram. After slaughtering, the criteria for evaluation are the weight, the width and

length of the carcass, the carcass yield, and the extent of external and internal fat.

Finally, all breeds included, only the Top 100 progeny testing rams are qualified as "beefing abilities enhancers" (AMBO) and selected to be released by artificial insemination.

**The rams of hardy breeds** (Blanche du Massif Central, Lacaune meat, Causse du Lot) **and of some specialized meat breeds** (Ile de France, Vendéen, ...) **are also progeny tested to evaluate the maternal traits** (prolificacy, milking abilities) of their daughters. These programs include 100-120 rams a year. The best of them are qualified as "Maternal Abilities Enhancers" (AMEL) or "Meat and Maternal Abilities Enhancers" (ELITE), and are released by AI.

### LAMBS WITH A REMARKABLE GROWTH

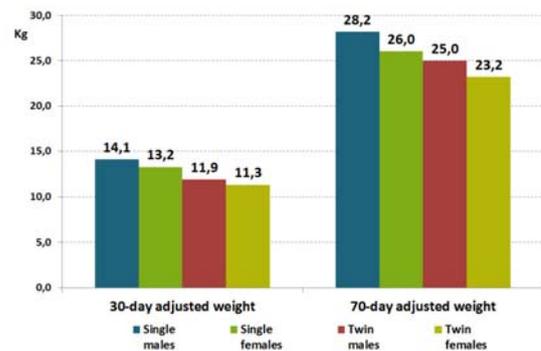


GEODE

For the specialized meat breeds, the Average Daily Gain of lambs between 30 and 70 days varies between 287 and 378 g depending on the breed, the sex and the farming system.

The 30-day adjusted weight were between 11.3 and 14.1 kg depending on the sex and the farming system.

The 70-day adjusted weight varied between 23.2 and 28 kg. Over the last 10 years these weights at 70 days have increased from 1.1 to 1.5 kg depending on the category..



Source : Institut de l'Élevage / Races de France

# Berrichon du Cher

## THE BREED IN FRANCE

40,000 ewes  
17 flocks under official performance recording system  
2,657 ewes under on-farm official performance recording system  
17,894 inseminations

## FRAME

Adult ewe weight: 70 to 90 kg  
Adult ram weight: 100 to 140 kg

## TRAITS\*

Prolificacy after natural estrus: 1.57  
30-day weight (singleton male): 13.8 kg  
70-day weight (singleton male): 28.3 kg  
Average Daily Gain 30-70 days (singleton male): 363 g



\* Results of on-farm performance recording system 2012  
Institut de l'Elevage & Races de France

## Traits and performances

The Berrichon du Cher has been targeted at meat production since it originated in the 18th century. This long-lasting breeding process has resulted in a well-conformed breed (the majority of lambs are classified as U in the E.U.R.O.P. quality grid, but without excess fat), characterized by early growth.

Berrichon ewes also have a natural ability to lamb out-of-season: 60% of lambs are naturally born from September to November, a schedule which provides high flexibility in terms of production.

**Its meat production traits have not kept the Berrichon du Cher from retaining its hardiness and ability to cover wide distances, which render the breed suitable for various livestock management systems and territory types.**

For example, the breed enables production of well-conformed sheepfold lambs, as a complement to grain cultivation: lambing then takes place in the sheepfold from October to February and the ewes are turned out to pasture after the lambs have been weaned.

The breed is also suitable for free-range or semi-free-range breeding systems, with later lambing during spring and a grass finishing phase.

**With rams that strongly influence their progeny and production of well-conformed and early-maturing animals, the Berrichon du Cher is highly valued in terminal crossbreeding, especially with hardy slender breeds or prolific breeds.** The breed is also very popular as an export product, particularly to countries within the European area.

## Selection

The primary breeding objective is to improve the breed's meat production qualities. The genetic improvement program led by Geode is based on the 2 700 ewes with on-farm official performance recording.

The ewes with the best maternal traits participate in planned mating by artificial insemination with rams qualified as "Improvers": **100 to 150 rams resulting from these mating programs are evaluated through individual on-station testing.**

**The 10 best animals are then progeny tested on meat production criteria:** growth rate, carcass quality (fattening level and fat distribution in particular).

Based on the results of this progeny testing, the rams qualified as "Improvers" are then propagated by artificial insemination.

## MORE

**Organisme de sélection GEODE**  
[www.geodesheep.com](http://www.geodesheep.com)

**Entreprise de sélection Insémovin**  
[www.insemovin.pagesperso-orange.fr](http://www.insemovin.pagesperso-orange.fr)

**Races de France**  
[www.racesdefrance.fr](http://www.racesdefrance.fr)

# Blanche du Massif Central

## THE BREED IN FRANCE

359,000 ewes  
60 flocks under official performance recording system  
22,955 ewes under on-farm official performance recording system  
11,194 inseminations

## FRAME

Adult ewe weight: 60 to 80 kg  
Adult ram weight: 90 to 140 kg

## TRAITS\*

Prolificacy after natural estrus: 1.5  
30-day weight (singleton male): 13.3 kg  
70-day weight (singleton male): 28.2 kg  
Average Daily Gain 30-70 days (singleton male): 364 g

\* Results of on-farm performance recording system 2012  
Institut de l'Élevage & Races de France



## Traits and performances

This breed, originated from the Margeride in Lozère, quickly spread to the regions surrounding its native home area. It is now primarily found in the Massif Central and Languedoc-Roussillon.

The hard and dry soils of the Causses, which have always been its natural habitat, have made the Blanche du Massif Central able to withstand difficult breeding conditions.

**Its ability to cover wide distances and its hardiness make it adaptable to arid and dry areas, as well as more mountainous regions.**

The breed's good conformation, build and growth rate allow for farmers to manage large purebred flocks.

**The carcasses, which are heavy and low in fat, are well monetized thanks to various official quality labels.** Terminal cross-breeding with specialized meat-breed rams is therefore rare.

Lamb production is possible throughout the year, as ewes are adapted to out-of-season lambing. The breed therefore adapts well to market-led demand and provides sales channels with a steady supply of quality carcasses.

## Selection

The main breeding program objectives are to improve maternal abilities and meat production qualities, as well as scrapie resistance.

**Maternal traits are improved through suckling abilities** (which makes it possible to produce better-conformed lambs and reduce food supplement costs), and prolificacy (number of lambs per ewe per year).

The improvement of meat production qualities primarily hinges on work targeting carcass quality. To ensure the success of the breeding program, the Massifs Sheep Breed Selection Organization bases its work on the performance recordings in the selection flocks.

**Individual on-stations testing (or breeding centers) then gather together the future sires, and the best rams are progeny-tested.**

## MORE

**Organisme de sélection Races Ovines des Massifs (ROM)**  
[www.races-ovines-des-massifs.com](http://www.races-ovines-des-massifs.com)

**CORAM**  
[www.races-montagnes.com](http://www.races-montagnes.com)

**Races de France**  
[www.racesdefrance.fr](http://www.racesdefrance.fr)

# Causse du Lot

## THE BREED IN FRANCE

107,695 ewes  
56 flocks under official performance recording system  
29,369 ewes under on-farm official performance recording system  
5,306 inseminations

## FRAME

Adult ewe weight: 60 to 65 kg  
Adult ram weight: 90 to 110 kg

## TRAITS\*

Prolificacy after natural estrus: 1.61  
30-day weight (singleton male): 12.4 kg



\* Results of on-farm performance recording system 2012  
Institut de l'Élevage & Races de France

## Traits and performances

Originating in the Lot département, this breed has developed a high level of hardiness and the ability to walk over long distances. It's thus very well adapted to free-range as well as sheepfold breeding systems.

Its docility and maternal qualities make it possible to operate large flock sizes.

The ewes mature at an early age, can be mated starting at 7 or 8 months and easily adapt to out-of-season lambing without need for hormone treatment.

These qualities allow farmers to conduct two matings per year, and accelerate the lambing schedule (3 lambings in 2 years).

The suckling abilities of the ewes enable them to produce well-conformed lambs and suckle twin lambs without difficulty.

The Causse du Lot is often crossbred with specialized meat-breed Ile de France or Berrichon du Cher rams to produce better-conformed lambs that better match market needs.

Farmers monetize the products of such crossbreeding thanks to the "Agneau Fermier du Quercy" Protected Geographical Indication (IGP), which was granted in 1996.

## Selection

The breeding program managed by OVILOT is unique in that it is made up of two sections. On the one hand, improvement of maternal traits (prolificacy and suckling abilities) is pursued on a population of purebred ewes by breeding program with on-farm progeny testing.

On the other hand, producing so-called "F1 46" ewes, resulting from crossbreeding Causse du Lot ewes with Ile de France rams, aims at improving breed conformation.

The purpose of implementing this dual-tiered scheme is to ensure the renewal of flocks with purebred ewes presenting the best guarantees from both genetic and health standpoints.

This organization makes it possible to propagate 11,000 Causse du Lot ewe lambs and 6,000 F1 46 ewe lambs per year.

**MORE**

**CORAM**

[www.races-montagnes.com](http://www.races-montagnes.com)

**Races de France**

[www.racesdefrance.fr](http://www.racesdefrance.fr)

# Charmoise

## THE BREED IN FRANCE

24,000 ewes  
26 flocks under official performance recording system  
3,245 ewes under on-farm official performance recording system

## FRAME

Adult ewe weight: 50 to 80 kg  
Adult ram weight: 80 to 100 kg

## APTITUDES\*

Prolificacy after natural estrus: 1.15  
30-day weight (singleton male): 10.9 kg  
70-day weight (singleton male): 21.2 kg  
Average Daily Gain 30-70 days (singleton male): 271 g



\* Results of on-farm performance recording system 2012  
Institut de l'Élevage & Races de France

## Traits and performances

Resulting from various crossbreeding programs undertaken in central France at the end of the 19th century, the Charmoise is now found primarily in central western France as well as in south-western regions.

With a reputation for needing little care and the ability to make use of all forage types with a minimum of outside intervention, the Charmoise is particularly well-adapted to difficult environments.

Most often bred in free-range systems, the ewes generally lamb in spring, although a natural capacity for out-of-season lambing produces a significant percentage of autumn lambings.

The moderate growth rate of the Charmoise is an asset: lambs born in spring are suckled, and then turned out to pasture after weaning to be finished; this takes place after the summer dry period on autumn regrowth and without complementary feed.

Their ability to fatten on grass, or with little need for supplementary food, enables production of carcasses of a decent weight, with the coloration characteristics of young meat despite its age, and at low production costs.

Charmoise rams are regularly crossbred with hardy breeds for their exceptional conformation, and with primiparous ewes for their fine bone structure which ensures easy lambing.

## Selection

The main breeding objectives are to improve the breed's carcass value (animal conformation) while preserving the hardiness and capacity for grass-feed management that characterize the Charmoise. Scrapie resistance is also one of the program criteria.

To ensure the success of the breeding program, the Charmoise breed section of the GEODE Selection Organization makes use of performance recording carried out in the selection flocks.

The individual on-station testing center then gathers the best young rams from each farm.

Once individual testing is complete, the best rams are collectively propagated as artificial insemination stock sires.

## MORE

**Organisme de sélection GEODE**  
[www.geodesheep.com](http://www.geodesheep.com)

**Entreprise de sélection Insémovin**  
[www.insemovin.pagesperso-orange.fr](http://www.insemovin.pagesperso-orange.fr)

**Races de France**  
[www.racesdefrance.fr](http://www.racesdefrance.fr)

# Charollais

## THE BREED IN FRANCE

281,000 ewes  
127 flocks under official performance recording system  
7,783 ewes under on-farm official performance recording system  
54,888 inseminations

## FRAME

Adult ewe weight: 80 to 95 kg  
Adult ram weight: 110 to 170 kg

## TRAITS\*

Prolificacy after natural estrus: 1.79  
30-day weight (singleton male): 15.4 kg  
70-day weight (singleton male): 28.5 kg  
Average Daily Gain 30-70 days (singleton male): 327 g

\* Results of on-farm performance recording system 2012  
Institut de l'Élevage & Races de France



## Traits and performances

Charollais sheep can be found throughout France, with a particularly high concentration in Bourgogne, the Massif Central, Poitou-Charentes, the Limousin and the south-west.

The breed has spread far beyond its native region thanks to a combination of maternal abilities and meat production qualities. The Charollais sheep is bred free-range or semi-free range, with mating primarily in autumn. The breed also makes it possible to raise lambs through grass-grazing.

Early maturity and ewe prolificacy are completed by high suckling abilities: ewes can thus suckle their lambs without difficulty, 80% of twin births being raised together.

The rapid growth rate of the Charollais allows farmers to produce heavy lambs with carcasses free of excess fat. Furthermore, the fine-boned structure and conformation of the lambs make the Charollais a prime meat-producing sheep.

These meat production traits explain the broad use made of Charollais rams for terminal crossbreeding, both nationally and internationally. Rams are currently propagated in more than 20 countries. The Charollais breed thus represents 40 to 50% of French sheep genetic material exports.

## Selection

Breed selection objectives are to further meat production traits (growth, conformation, carcass quality, fattening) while preserving its maternal qualities (early maturity, fertility, prolificacy, suckling abilities) which are remarkable for a meat-breed.

Scrapie resistance is also a criterion considered in sires' choice. **The breed has its own ram progeny control station at Insémovin, which enables progeny testing of the 14 best rams selected from the 180 rams controlled in individual on-station testing center.**

Sire propagation in France or abroad is carried out both through natural servicing and artificial insemination.

## MORE

**Organisme de sélection Mouton Charollais**  
[www.mouton-charollais.com](http://www.mouton-charollais.com)

**Entreprise de sélection Insémovin**  
[www.insemovin.pagesperso-orange.fr](http://www.insemovin.pagesperso-orange.fr)

**Races de France**  
[www.racesdefrance.fr](http://www.racesdefrance.fr)

# Ile de France

## THE BREED IN FRANCE

235,700 ewes  
64 flocks under official performance recording system  
13,627 ewes under on-farm official performance recording system  
11,839 inseminations

## FRAME

Adult ewe weight: 70 to 90 kg  
Adult ram weight: 100 to 150 kg

## TRAITS\*

Prolificacy after natural estrus: 1.75  
30-day weight (singleton male): 14.7 kg  
70-day weight (singleton male): 28.9 kg  
Average Daily Gain 30-70 days (singleton male): 353 g



\* Results of on-farm performance recording system 2012  
Institut de l'Elevage & Races de France

## Traits and performances

Resulting from the controlled crossbreeding of the English Dishley breed and the Rambouillet Merino, the Ile de France breed stabilized as early as the 19th century in beet producing areas. It is still widely found in Picardie, Champagne-Ardenne, Burgundy and central France.

**This heavy and early-maturing breed is characterized by a good balance between meat production traits and maternal qualities (prolificacy, suckling abilities).** It reaches its full potential in sheepfold farming systems, with autumn lambing. It also adapts well to free-range or semi-free-range systems, with or without complementary feed for lambs, depending on objectives and sales periods.

Its natural capacity for out-of-season lambing makes it possible to mate ewe lambs at 9-10 months, and then establish yearly autumn lambing. An accelerated 3/2 lambing system is possible.

**Lambs are exceptionally well-conformed and have a high growth rate, which makes the Ile de France a breed that can be used both as a purebred and in crossbreeding to improve the meat production performance of more hardy breeds.**

Thanks to this set of qualities, the Ile de France has been widely exported since the 50s. The breed can be found on all 5 continents, and demand remains strong in western and eastern European countries, in the Mediterranean belt, and South America.

## Selection

The breeding objectives for the Ile de France breed are to simultaneously improve maternal traits and meat production qualities, while preserving wool qualities and adaptability to out-of-season lambing.

Scrapie resistance is also integrated under the breed's selection criteria.

**The breeding program is based on on-farm ewes performance recording, individual on-station testing of meat production traits and progeny testing of the best of these young rams for meat production qualities (at the FEDATEST station) and on maternal traits, prolificacy and suckling abilities (on-farm).**

## MORE

**Organisme de sélection OSON Ile de France**  
[www.mouton-ile-de-france.com](http://www.mouton-ile-de-france.com)

**Entreprise de sélection Insémovin**  
[www.insemovin.pagesperso-orange.fr](http://www.insemovin.pagesperso-orange.fr)

**Races de France**  
[www.racesdefrance.fr](http://www.racesdefrance.fr)

# Lacaune meat line

## LA RACE EN FRANCE

300,000 ewes  
37 flocks under official performance recording system  
13,771 ewes under on-farm official performance recording system  
96,445 inseminations

## FRAME

Adult ewe weight: 70 to 90 kg  
Adult ram weight: 100 kg to 150 kg

## TRAITS\*

Prolificacy after natural estrus: 1.83  
30-day weight (singleton male): 13.7

\* Results of on-farm performance recording system 2012  
Institut de l'Élevage & Races de France



## Traits and performances

The meat line Lacaune is the result of a Lacaune-based breeding program led since 1970 for meat production qualities.

Flocks are managed in sheepfold for part of the year, then turned out to pasture. In most cases, lambs are suckled and raised in the sheepfold.

Reproduction can take place through crossbreeding with specialized meat-breed rams, but **managing purebred flocks is also common as the improvement of meat production traits through breeding programs has yielded positive results.**

The capacity of ewes to naturally lamb out of season makes it possible to establish accelerated reproduction systems (3 lambings in 2 years). Lamb production is thus spread over the whole year and is often commercialized under the Label Rouge "Agneau Fermier", which is characterized by young, tender, light-colored meat.

This production is also marketed under the "Agneau Fermier des Pays d'Oc", "Agneau Fermier Lou Paillol" or "Agneau d'Aveyron" collective quality brands.

## Selection

The meat line Lacaune is unique in that it has two distinct **breeding programs managed by the Breeding Companies OVI-TEST and GID Lacaune.** The significant size of the Lacaune population makes it possible for these two programs to coexist without compromising the integrity of the breed.

**The breeding objectives of the two programs reflect different yet complementary directions.**

The Ovi-Test program aims at improving maternal qualities as a priority (natural estrus prolificacy, suckling abilities, out-of-season lambing), to improve breed's productivity. The program is in particular interested in the management of a gene that makes ewes hyper-prolific.

The program led by GID Lacaune places a priority on improving meat production qualities (conformation, growth rate, carcass quality). The introduction of a hyper-muscling gene is currently under experiment on a portion of animals in the selection flocks. Both organizations also integrate scrapie resistance to their breeding criteria.

## MORE

**Organisme de sélection Lacaune**  
[www.brebis-lacaune.monsite-orange.fr](http://www.brebis-lacaune.monsite-orange.fr)

**Entreprise de sélection Ovitest**  
[www.unotec.net](http://www.unotec.net)

**Génétique Lacaune Export**  
[www.genelex.monsite-orange.fr](http://www.genelex.monsite-orange.fr)

**GID Lacaune**  
[www.gidlacaune.fr](http://www.gidlacaune.fr)

**Races de France**  
[www.racesdefrance.fr](http://www.racesdefrance.fr)

# Limousine

## THE BREED IN FRANCE

38,400 ewes  
37 flocks under official performance recording system  
7,090 ewes under on-farm official performance recording system

## FRAME

Adult ewe weight: 60 to 80 kg  
Adult ram weight: 80 to 120 kg

## TRAITS\*

Prolificacy after natural estrus: 1.37  
30-day weight (singleton male): 12.3 kg



\* Results of on-farm performance recording system 2012  
Institut de l'Élevage & Races de France

## Traits and performances

Originating from northern part of the Massif Central, the Millevaches plateau in particular, the Limousin breed has developed a high degree of hardiness in this area characterized by a harsh and varied climate, high rainfall in winter, dry summers and light acidic soils.

Its resistance and adaptability explain its success in mid-range mountain areas (northern Massif Central, western Vosges) or in hot, dry areas (Aude, eastern Pyrenees).

Ewes offer high prolificacy, good suckling abilities, and are fairly adaptable to out-of-season lambing, which makes them able to lamb four times in three years. Production of grass-fed lambs as well as of sheepfold lambs is therefore regularly spaced out over the course of the year.

Crossbreeding with specialized meat-breed rams is regularly implemented to improve lamb conformation, while making use of the maternal qualities of the mothers.

## Selection

The prioritized objective of the Limousin breeding program is to improve the maternal qualities of ewes (suckling abilities, prolificacy), which represent the great assets of the breed. Scrapie resistance is also tested.

## MORE

**Organisme de sélection Races Ovines  
des Massifs (ROM)**

[www.races-ovines-des-massifs.com](http://www.races-ovines-des-massifs.com)

**CORAM**

[www.races-montagnes.com](http://www.races-montagnes.com)

**Races de France**

[www.racesdefrance.fr](http://www.racesdefrance.fr)

# Mérinos d'Arles

## THE BREED IN FRANCE

283,300 ewes  
18 flocks under official performance recording system  
12,975 ewes under on-farm official performance recording system

## FRAME

Adult ewe weight: 60 kg  
Adult ram weight: 70 to 90 kg

## TRAITS\*

Prolificacy after natural estrus: 1.37  
30-day weight (singleton male): 12.3 kg



\* Results of on-farm performance recording system 2012  
Institut de l'Élevage & Races de France

## Traits and performances

Originating from the Crau plain, 90% of the Arles Merinos breed population is located in the Provence-Alpes-Côte-d'Azur region, but it has also spread to the Drôme and Isère départements.

**The main farming system associated with this breed is characterized by a diet based almost exclusively on grazing.**

Flock management is organized around a cycle that alternates between a long transhumance from June to October throughout the Alps and grazing in the prairieland and transhumance routes of lower Provence and the lower Alps from October to June. Flocks move to new grazing areas as the vegetation changes.

**The Arles Merinos ewe is known for its capacity to draw on energy reserves and thus cope with fluctuating feed availability (both in quantity and quality).**

The quality of merino fleece offers natural protection against harsh weather conditions (rain, cold, heat waves) in the mountains, but also during the wintering season in Crau.

**Its herd instinct facilitates management in large flocks counting several thousand heads:** it features one of the largest flock sizes of all breeds (700 animals on average). The mating period generally takes place before flocks move to highland pastures and rangeland, but a natural capacity for out-of-season lambing makes a second mating period possible, called "repassing", while returning from the mountains.

Lambing can occur at different times of the year in varying weather conditions, which results in very diverse productions, ranging from milk-fed lamb to finishing lamb.

## Selection

**Genetic selection primarily focuses on the male line and is based on parents' evaluation: rams are selected based on their parents' performance.**

The main objectives of the breeding program are to preserve breed characteristics (general morphology of the animal, horn qualities, wool quality and fineness, hardiness, capacity for out-of-season lambing), to improve maternal qualities, suckling abilities and ewe prolificacy, and finally scrapie resistance.

## MORE

### CORAM

[www.races-montagnes.com](http://www.races-montagnes.com)

### EVISE

[www.evise.fr](http://www.evise.fr)

### La maison de la transhumance

[www.transhumance.org](http://www.transhumance.org)

### Races de France

[www.racesdefrance.fr](http://www.racesdefrance.fr)

# Préalpes du Sud

## THE BREED IN FRANCE

241,000 ewes  
13 flocks under official performance recording system  
5,157 ewes under on-farm official performance recording system

## FRAME

Adult ewe weight: 55 to 70 kg  
Adult ram weight: 75 to 100 kg

## TRAITS\*

Prolificacy after natural estrus: 1.21  
30-day weight (singleton male): 12.1 kg



\* Results of on-farm performance recording system 2012  
Institut de l'Élevage & Races de France

## Traits and performances

The Préalpes du Sud breed is still localized in its native home region: the Alp foothills, where the Drôme, Hautes-Alpes, Alpes-de-Haute-Provence and Vaucluse départements meet.

**The Préalpes is able to cope with high temperatures, and can exploit rough forage resources (transhumance routes and scrubland). Its hardiness allows flocks managed through transhumance to thrive in summer pastures.**

This ewe has a good capacity for out-of-season lambing, a sought-after characteristic for accelerated season production especially for official quality labels. **It also has good carcass value and growth potential, and as a result is most often used in purebred form for producing meat lambs. It can also be easily cross-bred with specialized meat-breed rams like the Berrichon du Cher.**

The Préalpes is most often farmed in specialized farming systems or in dual-purpose systems where sheep production dominates with complementary hay and grain sales activities.

In areas that produce good forage, farming is managed under a more intensive system. The flock is most often sedentary, with some wintering in sheepfolds for relatively long periods. It is managed with two lambing periods (February-March and August-September), and even up to three lambings in two years.

Breeding is managed more extensively in large, dry transhumance areas (scrubland, moorland): flock management is associated with heavy pastoral activity and most often closely follows grass growth. The lambing period logically takes place in spring in order to best exploit forage resources.

Mountain farming is characterized by alternating wintering periods in sheepfolds and summer pasture periods. Farmers then make use of ewes with heavier wool. Lambing takes place primarily in autumn, with a catch-up period in spring.

These 3 main breeding systems lead to a wide variety of meat product types: sheepfold lambs, heavy lambs sold after transhumance, etc. A portion of the ewes is used for cross-breeding with specialized meat-breed rams.

## Selection

Genetic selection primarily focuses on the male line and is based on parents' evaluation: rams are selected based on their parents' performance.

The main objectives of the breeding program are to preserve breed characteristics (general morphology of the animal, hardiness, capacity for out-of-season lambing), and to improve maternal qualities, suckling abilities, ewe prolificacy, and finally scrapie resistance.

## MORE

### CORAM

[www.races-montagnes.com](http://www.races-montagnes.com)

### EVISE

[www.evise.fr](http://www.evise.fr)

### La maison de la transhumance

[www.transhumance.org](http://www.transhumance.org)

### Races de France

[www.racesdefrance.fr](http://www.racesdefrance.fr)

# Romane

## THE BREED IN FRANCE

100,000 ewes  
66 flocks under official performance recording system  
20,454 ewes under on-farm official performance recording system  
5,443 inseminations

## FRAME

Adult ewe weight: 70 to 80 kg  
Adult ram weight: 90 to 100 kg

## TRAITS\*

Prolificacy after natural estrus: 2.14  
30-day weight (singleton male): 13.2 kg  
70-day weight (singleton male): 28.1 kg  
Average Daily Gain 30-70 days (singleton male): 357 g

\* Results of on-farm performance recording system 2012  
Institut de l'Élevage & Races de France



## Traits and performances

The Romane - also known as INRA 401 - was developed through a breeding program that the INRA (French national institute for agricultural research) has been running since 1963 to improve the prolificacy figures of French national sheep stock.

**INRA 401 was bred by crossing Romanov (for its prolificacy traits) with Berrichon du Cher (for its carcass meat production qualities).**

The Romane breed combines the traits of these two breeds. **Its prolificacy is high, with an average between of 2 and 2.3 according to seasons. Its mothering qualities make its rearing easy:** good suckling abilities, highly developed maternal behavior (easy lambing and adoption...). It has a very good natural capacity for out-of-season lambing, allowing year-round production without using hormone treatments.

**Its hardiness enables Romane to be reared in all French regions (low and highlands, dry plateaus) and farming systems (free-range, semi-free-range, sheepfold, trans-humance).** Rearing Romane has not special requirements other than care with diet management over the late-gestation to early-suckling period.

The breed is mainly used for terminal crossbreeding with specialized meat-breed rams.

## Selection

The selection objectives aims at improving both breed maternal traits (stabilization of prolificacy in 2 after natural estrus, improvement of suckling abilities and fertility) and meat production abilities (growth, conformation, carcass yield), as well as scrapie resistance

## MORE

**Organisme de sélection Romane**  
[www.brebis-romane.com](http://www.brebis-romane.com)

**Entreprise de sélection GEODE**  
[www.geodesheep.com](http://www.geodesheep.com)

**Races de France**  
[www.racesdefrance.fr](http://www.racesdefrance.fr)

# Rouge de l'Ouest

## THE BREED IN FRANCE

111,400 ewes  
32 flocks under official performance recording system  
4,796 ewes under on-farm official performance recording system  
28,352 inseminations

## FRAME

Adult ewe weight: 70 to 800 kg  
Adult ram weight: 90 to 150 kg

## TRAITS\*

Prolificacy after natural estrus: 1.9  
30-day weight (singleton male): 14.4 kg  
70-day weight (singleton male): 26.3 kg  
Average Daily Gain 30-70 days (singleton male): 326 g



\* Results of on-farm performance recording system 2012  
Institut de l'Élevage & Races de France

## Traits and performances

The native home region of the Rouge de l'Ouest is the Mayenne, Maine et Loire and Sarthe départements, but the breed developed rapidly in the surrounding départements as well and purebred flocks are now found primarily in the Poitou-Charentes, Pays de la Loire and Brittany regions.

This large-framed breed is most often managed in semi-free-range systems, with grass-feeding methods often associated with cattle breeding. The ewes are turned out to pasture, except during winter.

Lambing takes place in February-March in sheepfolds. In the farms in the selection flocks, 30% of lambings take place in November-December for genetic purposes, through artificial insemination to evenly distribute the best rams of the breed, qualified as "Meat Improvers".

Ewe lambs mature early enough for their first mating to take place as soon as the following mating season, in autumn. Some farmers manage to accelerate reproductive rhythms using hormone treatments, with the goal of reaching steadier lamb production spread over the course of the year.

The Rouge de l'Ouest is a breed with good prolificacy and its high suckling abilities enables dams to easily suckle multiple lambs. Lambs are either left to suckle to produce grass-fed lambs or quickly weaned and fattened to produce heavier lambs. Rams are used in purebred but also crossbreeding, that enables to produce lambs with better frame and conformation without excessive fat.

## Selection

Defined by the GEODE Selection Organization, the breed improvement objectives are primarily focused on meat production qualities, while also maintaining breeding qualities (prolificacy and suckling abilities).

The individual on-station testing site located in the Maine-et-Loire is one of the program's key resources for controlling sires within the program: selection of lambs born from the most productive ewes, choice of rams to be progeny-tested and propagated in priority to the selection flocks and artificial insemination centers.

## MORE

Organisme de sélection GEODE  
[www.geodesheep.com](http://www.geodesheep.com)

Entreprise de sélection Insemovin  
[www.insemovin.pagesperso-orange.fr](http://www.insemovin.pagesperso-orange.fr)

Races de France  
[www.racesdefrance.fr](http://www.racesdefrance.fr)

# Suffolk

## THE BREED IN FRANCE

166,000 ewes  
32 flocks under official performance recording system  
2,930 ewes under on-farm official performance recording system  
60,209 inseminations

## FRAME

Adult ewe weight: 65 to 90 kg  
Adult ram weight: 80 to 150 kg

## TRAITS\*

Prolificacy after natural estrus: 1.64  
30-day weight (singleton male): 15.2 kg  
70-day weight (singleton male): 31.3 kg  
Average Daily Gain 30-70 days (singleton male): 400 g

\* Results of on-farm performance recording system 2012  
Institut de l'Élevage & Races de France



GEODE

## Traits and performances

English in origin, the Suffolk breed was imported to France as early as the 19th century. French farmers have focused on making it thicker, more prolific and better adapted to continental and Mediterranean climates.

Purebred flocks can primarily be found in northern, central and south-western France, whereas rams are used for crossbreeding throughout the country, and beyond: the breed is extensively exported throughout Europe, but also to the Maghreb or the West Indies.

The Suffolk is exploited as a purebred, whose maternal qualities, prolificacy and suckling abilities are highly sought-after. It is also used for crossbreeding with numerous other breeds; its early maturity and excellent conformation enable to produce heavy lambs without excess fat.

It is above all a grassland breed, managed with a lambing rhythm of once per year. Its high level of productivity enables it to get the best value out of cultivated forage areas. It also prospers in sheepfolds, where it is even easier to get the most out of lamb growth potential.

## Selection

The breeding objectives for this breed aim at improving meat production qualities (conformation and fattening level for early-maturing heavy lambs) while preserving maternal qualities (prolificacy, suckling abilities, etc.).

## MORE

Organisme de sélection GEODE  
[www.geodesheep.com](http://www.geodesheep.com)

Entreprise de sélection Insemovin  
[www.insemovin.pagesperso-orange.fr](http://www.insemovin.pagesperso-orange.fr)

Races de France  
[www.racesdefrance.fr](http://www.racesdefrance.fr)

# Tarasconnaise

## THE BREED IN FRANCE

152,100 ewes  
46 flocks under official performance recording system  
9,158 ewes under on-farm official performance recording system  
948 inseminations

## FRAME

Adult ewe weight: 60 to 70 kg  
Adult ram weight: 80 to 100 kg

## TRAITS\*

Prolificacy after natural estrus: 1.2  
30-day weight (singleton male): 12 kg



\* Results of on-farm performance recording system 2012  
Institut de l'Élevage & Races de France

## Traits and performances

The Tarasconnaise, whose native home region is located in the Ariège, is now mainly found in the central Pyrenees (Ariège, Hautes Pyrénées).

This breed is particularly well-adapted to farming systems that use transhumance: it can cover wide distances, handle sharp temperature variations well, and adapt to changes in forage resources. After wintering in sheepfolds, the flocks progressively climb to summer pastures, reaching the highest pastures (1,200 m) around June.

Rams stay with the flock and siring can continue during transhumance, which spreads lambing across the year. However, the bulk of production is still grazer lambs sold after the flocks come down from summer pastures.

## Selection

The objectives of the breeding program are to improve suckling abilities and the capacity to lamb out of season. Conjointly, it seeks to maintain hardiness, which is necessary for a breed that practices transhumance, and continues to work on animal conformation and growth.

Selection is based on dam's evaluation, which enables identification of the ram dams that are subsequently used in planned mating.

The young rams that result from these planned matings are integrated into breeding centers after being selected on phenotype. The best rams will be used for artificial insemination, while the others are propagated as sires for natural servicing in the selection flocks.

**MORE**

Races de France  
[www.racesdefrance.fr](http://www.racesdefrance.fr)

# Texel

## THE BREED IN FRANCE

300,000 ewes  
39 flocks under official performance recording system  
4,441 ewes under on-farm official performance recording system  
9,686 inseminations

## FRAME

Adult ewe weight: 80 to 90 kg  
Adult ram weight: 115 to 130 kg

## TRAITS\*

Prolificacy after natural estrus: 1.88  
30-day weight (singleton male): 16.6 kg  
70-day weight (singleton male): 30 kg  
Average Daily Gain 30-70 days (singleton male): 330 g

\* Results of on-farm performance recording system 2012  
Institut de l'Élevage & Races de France



## Traits and performances

This Dutch breed was introduced to France in 1933, and then became the focus of a specific breeding program, which resulted in the "French Texel" appellation.

The Texel has developed primarily in north-eastern France before spreading to central and western-central parts of the country. This grass-fed breed is well-suited to temperate climates, under free-range management with lambing in the spring.

It has a low herd instinct, which allows optimal pasture management, most often in conjunction with dairy cattle. The Texel is characterized by one of the best prolificacy rates and good suckling abilities, which produces a high growth rate in lambs.

Purebred Texel lambs produce heavy, well-formed carcasses without excess fat and a high carcass yield. Almost all Texel ewes are managed as purebreds, while rams are commonly used for crossbreeding with grass-fed or hardy breeds to bring better conformation in the lambs.

The Texel's excellent meat production qualities has enabled France to begin exporting this breed to other European countries (Belgium, Germany, Luxembourg, central Europe, the United Kingdom, Spain), as well as to other continents (including South-Africa and Brazil, for instance).

## Selection

For the purebreeding, the goal is to obtain bloodlines characterized by improved performance in both maternal traits (prolificacy, suckling abilities) and meat production traits (growth rate, development, conformation, carcass quality, etc.).

The breeding program is based on on-farm performance recording. The resulting young rams are tested through individual on-station testing. **The 12 best rams are progeny tested in order to single out improver rams to be used for the breed (planned mating) and propagated by artificial insemination.**

## MORE

Races de France

[www.racesdefrance.fr](http://www.racesdefrance.fr)

Organismes de Sélection OSON Texel

[www.mouton-texel.fr](http://www.mouton-texel.fr)

# Vendéen

## THE BREED IN FRANCE

104,700 ewes  
30 flocks under official performance recording system  
7,037 ewes under on-farm official performance recording system  
10,835 inseminations

## FRAME

Adult ewe weight: 70 to 80 kg  
Adult ram weight: 110 to 150 kg

## TRAITS\*

Prolificacy after natural estrus: 1.77  
30-day weight (singleton male): 13.5 kg  
70-day weight (singleton male): 28.7 kg  
Average Daily Gain 30-70 days (singleton male): 354 g

\* Results of on-farm performance recording system 2012  
Institut de l'Elevage & Races de France



## Traits and performances

Developed by crossbreeding diverse and varied local sheep with the English Southdown breed, the Vendéen has been stabilized since the early 20th century. The breed's native home area is located in the Pays de la Loire - Poitou-Charentes regions.

These two regions have made the Vendéen well-adapted to temperature variations, as well as to alternating periods of drought and heavy rainfall.

The breed is suitable for free-range farming systems, semi-free-range systems in which ewes come into the sheepfold shortly before lambing according to their physiological condition, and sheepfold systems for intensive breeding. Meat lambs are most often sheepfold-fattened.

**The breed's high prolificacy is combined with early sexual maturity, which allows lambing in the first year and early mating does not adversely affect ewe lamb careers.**

**The meat production traits of the breed have gained a good reputation, resulting from good growth potential and excellent conformation.**

For these reasons, rams are often used for crossbreeding, which has extended the Vendéen's popularity towards the Limousin, central France, the Midi-Pyrénées, etc. as well as internationally.

## Selection

The breeding objectives for this breed aim at improving meat production qualities. The first stage of selection is based on parents' evaluation and planned mating: "Elite" and "Improver" rams are mated through artificial insemination or natural servicing with ewes qualified as Ram Dams and Ewe Dams.

The best female specimens resulting from this mating ensure breeding farm population renewal, while the best rams are integrated into individual on-station testing systems once their scrapie resistance has been checked.

Individual on-station selection takes place through testing, with the emphasis on meat production merit: muscle development, growth, fat, etc. **Progeny testing is then carried out on the best on-station rams, by mating with 100 ewes per ram to produce a minimum of 25 ewes that will then be tested with regard to suckling abilities and prolificacy.**

Concerning meat production qualities, the Selection Organization has initiated a progeny testing program in partnership with Insémovin to evaluate for meat production the rams propagated by artificial insemination. Each year, 10-12 rams participate in intra-breed comparisons. Performance data of a minimum of 20 progeny are recorded on-farm (weighing) and in the slaughterhouse (on carcasses).

## MORE

**Organisme de sélection Mouton Vendéen**  
[www.mouton-vendeen.fr](http://www.mouton-vendeen.fr)

**Entreprise de sélection Insemovin**  
[www.insemovin.pagesperso-orange.fr](http://www.insemovin.pagesperso-orange.fr)

**Races de France**  
[www.racesdefrance.fr](http://www.racesdefrance.fr)

# Other breeds of The Massif Central



## THE BREED IN FRANCE

9,700 ewes  
10 flocks under official performance recording system  
2,987 ewes under on-farm official performance recording system

## FRAME

Adult ewe weight: 50 to 60 kg  
Adult ram weight: 80 to 95 kg

## TRAITS\*

Prolificacy after natural estrus: 1.46  
30-day weight (singleton male): 11.5 kg



## THE BREED IN FRANCE

33,600 ewes  
19 flocks under official performance recording system  
6,883 ewes under on-farm official performance recording system

## FRAME

Adult ewe weight: 60 to 75 kg  
Adult ram weight: 80 to 100 kg

## TRAITS\*

Prolificacy after natural estrus: 1.57  
30-day weight (singleton male): 13 kg



## THE BREED IN FRANCE

15,000 ewes  
28 flocks under official performance recording system  
5,617 ewes under on-farm official performance recording system

## FRAME

Adult ewe weight: 65 kg  
Adult ram weight: 100 kg

## TRAITS\*

Prolificacy after natural estrus: 1.98  
30-day weight (singleton male): 13.4 kg



## THE BREED IN FRANCE

22,300 ewes  
17 flocks under official performance recording system  
4,568 ewes under on-farm official performance recording system

## FRAME

Adult ewe weight: 50 to 70 kg  
Adult ram weight: 80 to 110kg

## TRAITS\*

Prolificacy after natural estrus: 1.65  
30-day weight (singleton male): 12.6 kg

\* Results of on-farm performance recording system 2012 - Institut de l'Elevage & Races de France

## Traits and performances

The Massif Central is the birthplace of several hardy sheep breeds other than the Blanche du Massif Central, all of which are overseen by the Races Ovines des Massifs Breeding Organization.

The **Bizet** comes from a poor mid-range mountain area (Cantal, Haute Loire), the **Grivette** from Isère, although it has become current around its native home region, the **Noire du Velay** from the high volcanic plateaus of Velay and the **Rava** from the volcanic heights of the Auvergne.

What characterizes all of them is their adaptation to the ruggedness of the Massif Central region. They must be able to handle the alternation between dry summers and harsh winters. Ewes have the capacity to draw on their energy reserves if forage becomes scarce, then to rebuild them quickly during milder periods.

These breeds are also characterized by good maternal qualities (easy lambing, natural capacity for out-of-season lambing), which allow them to easily produce and suckle lambs resulting from crossbreeding with specialized meat-breed rams.

In addition to these common qualities, each breed has its own assets. **The Rava** is particularly well-adapted to out-of-season lambing, which enables an increased lambing rhythm, and its maternal qualities (easy lambing, suckling and nursing ability, acceptance of adoption) are highly appreciated.

**The Bizet** has a very social disposition, which facilitates flock handling, and displays a good level of hardiness, in particular through its ability to cover wide distances.

As for the **Grivette**, it is distinguished by the ease with which it adapts to out-of-season lambing, its productivity and easy adaptability to all farming systems.

Lastly, **the Velay Black** makes good use of low-productivity areas and these calm ewes with highly developed maternal instincts facilitate lambing management.

## Selection

The hardy Massif Central breeds are primarily selected for their maternal qualities (suckling abilities, prolificacy, out-of-season lambing), which are highly beneficial in F1 crossbreeding with specialized meat-breed rams.

All 6 Massif Central breeds share the same breeding program which is based on on-farm performance recording (ewe reproductive characteristics and suckling abilities), collective management of rams in breeding centers, and artificial insemination. About 40 rams of each breed are evaluated each year.

## MORE

Organisme de sélection Races Ovines des Massifs (ROM)  
[www.races-ovines-des-massifs.com](http://www.races-ovines-des-massifs.com)

CORAM  
[www.races-montagnes.com](http://www.races-montagnes.com)

Races de France  
[www.racesdefrance.fr](http://www.racesdefrance.fr)



F. DEVIERS

**BREEDING PROGRAMMES**

# Dairy sheep breed selection: efficient programmes



1

## Five breeds in five productions areas

Genetic improvement of dairy ewes in the three major sheep breeding

pools in France hinges on the selection of local breeds in their respective 'home' territories: the Lacaune breed (900,000 ewes) in and around Roquefort, the Basco-Béarnais, Black-face Manech and Red-face Manech (450,000 ewes) in the western Pyrenees, and the Corsican breed (95,000 ewes) in its native island.

The primary genetic selection objectives for each breed evolved over time in response to the policy decisions of each breed's Selection Organization. For the Lacaune breed, the pattern has been increasing dairy yield (in the 1970s and 1980s), then milk composition and cheesemaking capacities (1990s), and finally, since the early 2000s, improving functional traits (machine milkability, female-line fertility, resistance to diseases such as mastitis).

2

## A highly developed milk recording system

With 845,000 ewes registered under milk recording schemes, France's national herd is Europe's largest performance data-controlled herd. Within the Lacaune breed, all bred ewe-lambs undergo an udder morphology assessment. "User" breeders avail a complete simplified-version milk records designed with the dual objective of intra-herd selection and data integration into the technical support process.



Animal insemination has become the norm with outstanding success rates (55% to

75%) despite numerous sheep-specific constraints (fresh semen with a time of very limited conservation). More than 490,000 purebred animals are artificially inseminated every year (30% to 80% of ewes depending on breed).

1.4

million dairy ewes

Data 2012

845,560

ewes in performance recording

490,000

purebred inseminated females (FAI)

2,500

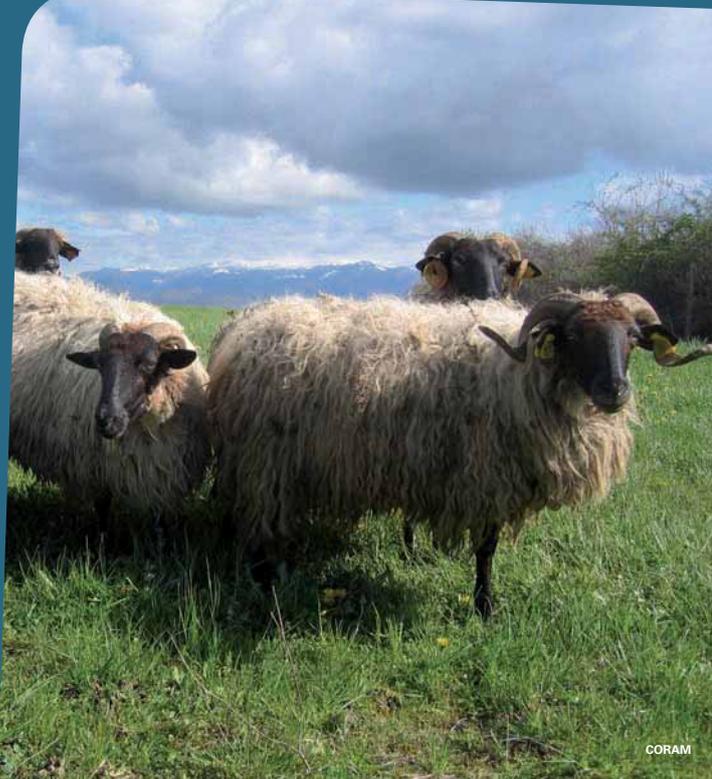
rams with on-station performances evaluation

642

rams with progeny testing

250

rams selected to be used by AI



CORAM



CORAM

### 3

## Each year, 700 rams progeny tested

The 2,500 best young rams sires from planned mating in these farms are selected at weaning and gathered on breeding stations. They will all be reared under the same conditions up to 6 to 8 months of age for pre-selection on non-dairying traits (growth and gain, breed standard, conformation, reproductive efficiency).

After this initial breeding phase, the top quartile of these young males, i.e. over 600 rams, is shortlisted for progeny testing. On the basis of performance records on their female offsprings, the final 250 best-performing rams are type-proofed as breed improvers for use as breed-standard AI stock sires.



### 4

## Major genetic progress at a regular pace

The Lacaune breed provides the best illustration, as ram stud genetic merit on the "milk yield" per ewe trait has climbed an average 5.3 litres per year, which equates to a total gain of 110 litres in just 20 years.

Over the same period, milk butterfat and milk protein content increased by 0.19 g/L and 0.16 g/L per year, respectively.



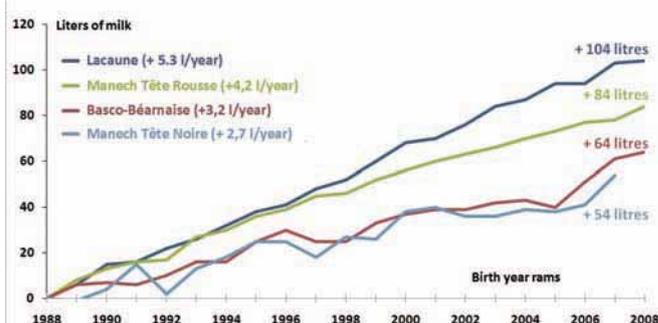
More recently, significant genetic progress on functional traits has been observed since the selection program was extended to integrate mastitis resistance in 2002 and then udder conformation in 2004.

These major genetics-driven improvements enabled each breed to achieve world-class milk yield performances: 289 L for Lacaune, 209 L for Red-face Manech, 183 L for the Basco-Béarnais, to name but a few.

These results are further strengthened by a remarkably rich milk solids content (in the Lacaune breed for example, 73 g/L is milk fat and 55 g/L is milk proteins).

#### GENETIC PROGRESS OF DAIRY SHEEP BREEDS RAMS

- Lacaune
- Manech tête rousse
- Manech tête noire
- Basco-béarnaise



Source : Institut de l'Élevage / INRA - 2011

# Corsican

## THE BREED IN FRANCE

95,000 ewes  
15,825 ewes under on-farm official performance recording system  
10,759 ewes under on-farm performance recording system  
6,483 inseminations

## FRAME

Adult ewe weight: 35 to 40 kg  
Adult ram weight: 60 to 70 kg

## TRAITS\*

Milk yield: 141,4 liters (in 185 days)



\* Official milk recording results 2012 - Institut de l'Élevage & CNBL

## Aptitudes et performances

The Corsican ewe, whose population is primarily concentrated on its native island although there are some flocks in mainland France, was traditionally bred in the high-altitude pastureland of the Corsican mountains.

It can now also be found in coastal plain farms that have forage resources available, but its traits remain those of a mountain breed. **Very hardy, able to cover wide distances and draw on its energy reserves in the event of a food shortage, it can easily be bred in a total free-range system in arid transhumance routes and pastures.**

Despite breeding conditions that are often harsh and its small build, the mean lactation of Corsican ewes frequently exceeds 100-120 litres, with output rates that hold steady. It exceeds 150 litres in breeding systems where feeding is steadier.

Its milk, which is rich in milk solids, is most often earmarked for producing Brocciu, a Corsican cheese that was granted an AOC in 1983.

## Selection

The selection programme for the Corsican breed started in 1986, with pedigree selection of rams. After testing in breeding centres, the first progeny testing of rams was organized starting in 1996.

**Selection objectives currently focus on increasing milk production while preserving the breed's hardiness.**

Secondary trait criteria that breeders appreciate, like ease of milking in particular, are thus considered in type-proofing dams selected to birth rams.

## MORE

**Interprofession Laitière Ovine et Caprine de Corse**

[www.ilocc-corse.com](http://www.ilocc-corse.com)

**Races de France**

[www.racesdefrance.fr](http://www.racesdefrance.fr)

**CORAM**

[www.races-montagnes.com](http://www.races-montagnes.com)

# Lacaune dairy line

## THE BREED IN FRANCE

900,000 ewes  
508,892 ewes under milk recording system  
169,619 ewes under official milk recording  
399,239 purebred inseminations

## FRAME

Adult ewe weight: 70 kg  
Adult ram weight: 100 kg

## TRAITS\*

Milk yield: 297,8 liters (in 166 days)



\* Official milk recording results 2012 - Institut de l'Élevage & CNBL

## Traits and performances

The breed's name comes from the county town located in the Lacaune highlands in the Tarn. The breed's native region includes the Aveyron and Tarn départements, as well as neighbouring areas (region called the "Roquefort Sector" in reference to the milk collection area).

Thanks to its dairy specialization, which began at the beginning of the 20th century, and then the subsequent creation of a meat branch within the breed (see Meat Lacaune Breed), the Lacaune has become the first French breed in population size.

It is also exported to numerous countries (Portugal, Spain, Greece, Tunisia, Slovakia, Switzerland, Germany, Austria, Hungary, Brazil, etc.).

The dairy Lacaune is still adapted to pasture management, but given the intensification of dairy production systems, it spends part of the year in the sheepfold.

Lambing takes place in the sheepfold once a year, and is concentrated at the end of autumn (November to January). Lambs are suckled for 5 weeks, then weaned so that the milking period can begin. The first weeks of milking also take place in the sheepfold, then the ewes are turned out to pasture during the day.

The Dairy Lacaune is primarily monetized by Roquefort cheese, but lamb production is also a significant source of income for breeders: Lacaune lambs are the first to arrive on the market every year.

## Selection

The Lacaune selection programme long focused on milk output quantities as its backbone, but today it also works with other improvement criteria such as milk content, functional traits (udder quality) and lower somatic cell counts.

Since 1990, the selection programme has enabled annual genetic progress amounting to over 5 l per lactation, 0.19 g/l in milk butterfat content and 0.17 g/l in crude protein content.

## MORE

**Organisme de sélection Lacaune**  
[www.brebis-lacaune.monsite-orange.fr](http://www.brebis-lacaune.monsite-orange.fr)

**Entreprise de sélection Ovitest**  
[www.unotec.net](http://www.unotec.net)

**Génétique Lacaune Export**  
[www.genelex.monsite-orange.fr](http://www.genelex.monsite-orange.fr)

**GID Lacaune**  
[www.gidlacaune.fr](http://www.gidlacaune.fr)

**Confédération Générale de Roquefort**  
[www.s-elevage.fr](http://www.s-elevage.fr)

**Races de France**  
[www.racesdefrance.fr](http://www.racesdefrance.fr)

# Dairy breeds of the Pyrenees



## THE BREED IN FRANCE

270,000 ewes  
61,526 inseminations

### FRAME

Adult ewe weight: 45 to 55 kg  
Adult ram weight: 55 to 70 kg

### TRAITS\*

Milk yield: 203.1 liters (in 161 days)



## THE BREED IN FRANCE

100,000 ewes  
7,010 inseminations

### FRAME

Adult ewe weight: 65 kg  
Adult ram weight: 80 kg

### TRAITS\*

Milk yield: 145.1 liters (in 143 days)



## THE BREED IN FRANCE

80,000 ewes  
15,355 inseminations

### FRAME

Adult ewe weight: 45 to 55 kg  
Adult ram weight: 55 to 70 kg

### TRAITS\*

Milk yield: 171.5 liters (in 145 days)

\* Official milk recording results 2012 - Institut de l'Élevage & CNBL

## Traits and performances

The Red-Face Manech is the Pyrenean dairy sheep breed with the largest population. It is traditionally raised in foothill areas. Next is the Black-Face Manech, which is most often found in mountainous areas. Finally, the Basco-Béarnaise, which is also found most often in mountainous areas, has a larger build than the Manech.

Although the Red-Face Manech still stands out as the highest dairy milk producer, all three breeds share an adaptability to high-altitude transhumance routes and extreme temperature variations. **These qualities, along with the low-maintenance needs of the ewes, make these Pyrenees dairy sheep breeds particularly well adapted to transhumance.** The use of summer pastures is indeed essential in these Western Pyrenees regions where farms are typically very small.

The Black-Face Manech and the Basco-Béarnaise spend more time in the summer pastures and at higher altitudes than the Red-Face Manech which, as a result of a more pronounced dairy specialization, has populated the more productive Basque upland slopes.

The ewes are easy to milk and used to produce the AOC cheese Ossau-Iraty, or cheeses using a mixture of ewe and cow milk.

## Selection

Set up in 1975, the selection programme for these breeds allows breeders to achieve levels of productivity that fully justify such these farming practices in difficult areas.

This programme uses the means that are best suited: milk testing and broad implementation of AI in the selection flocks, gathering young rams for selection in breeding centres, ram progeny testing of rams for milk output (quantity and now also composition), joint use of natural servicing and artificial insemination with favourably tested ram semen in commercial flocks.

The results are convincing, with annual genetic progress from 2.5 litres for the Black-Face Manech and the Basco-Béarnaise to over 4 litres for the Red-Face Manech.

### MORE

Races de France  
[www.racesdefrance.fr](http://www.racesdefrance.fr)

CORAM  
[www.races-montagnes.com](http://www.races-montagnes.com)



COMOEDIA

**BREEDING PROGRAMMES**

# Dairy goats selection programmes: significant genetic progress

1

## Balanced selection objectives

Mainly composed of two internationally-recognized breeds (55% and 40% Saanen Alpine), the French goat population have benefited for 30 years from dynamic breeding programs, in constant progression.

The continued increase in milk yield of Alpine and Saanen breeds is a key target. However, improving milk quality and functional morphology of animals is subject of special attention, thanks to balanced selection objectives.



Beyond the production level, other main selection criteria concern crude protein and fat contents together with breast morphology (profile, floor height, quality tie-back, ...) in order to maintain the grazing ability of animals, improve their longevity and optimize their milking time.

Maternal qualities (fertility, precocity) are actually preserved.

	COMPLETE LACTATIONS	AVERAGE LACTATIONS	FAT CONTENT	CRUDE PROTEIN
All breeds	299,709	946 kg	3.67%	3.40%
Alpine	166,282	915 kg	3.76%	3.47%
Saanen	124,040	996 kg	3.55%	3.33%

Source : Official milk recording results 2012 - Institut de l'Elevage & FCE

1,2

million dairy goats

Data 2012

343,000

goats in milk recording

70,000

purebred inseminated females (FAI)

150

billy goats with on-station controls

76

billy goats with progeny testing

40

billy goats selected to be used by insemination

2

## A breeding population of outstanding quality

Out of 343,000 goats subject to official milk recording, more than 170,000 goats (800 farmers) form the breeding population. Practices include a wide use of artificial insemination, the organization of planned mating, the use of genotyping (casein alpha S1) , etc...

The 1100 best females ("buck dams") of the breeding population show an exceptional performance, with a controlled average lactation exceeding 1100 kg per year.

Each year, the top 200 billy goats from the breeding population come in individual controls stations with international health standards.



After a quarantine period of 30 days for health, growth and conformation controls, only 120 males are kept. They are then subjected to rigorous controls on individual sexual behavior, semen

production (quality and quantity) and semen ability to resist freezing.

3

## A progeny testing, unique in the world



The best 70 bucks from the individual controls stations are then progeny tested to precisely determine their genetic level. For each male, this genetic evaluation is based on about

200 inseminations and control (milk production and breast morphology) of 80 female offsprings on average.

Looking at the number of daughters controlled, the French progeny testing system is unique in the world. In addition, the distribution of animals across the French territory in many farms with diverse rearing conditions provides highly reliable genetic evaluation results.

Finally, only the 30-40 best bucks are selected and approved to be used by insemination with frozen semen. All others are eliminated.

4

## Significant genetic progress for 20 years

For 20 years, the French selection programs allowed a remarkable genetic progress (excluding the effect of environment), both in quantity and quality of production.

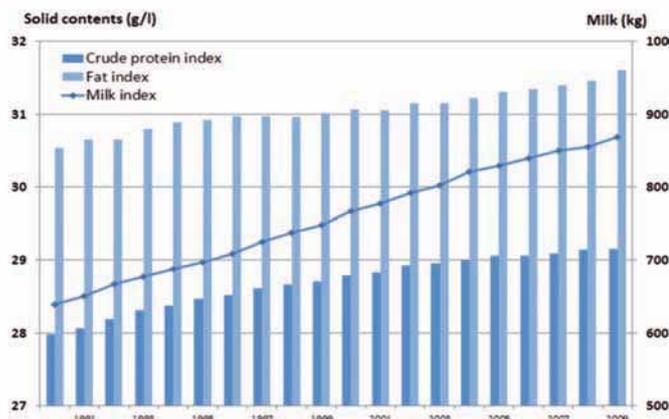
Each year, genetic progress generates an incremental production of about 12 kg of milk per lactation, and an annual gain of crude protein and fat of about 0.1 g / kg of milk.

In 10 years, the average milk yield of Saanen and Alpine populations has increased by 125 kg, thanks to genetic improvement alone.

In farms, the use of semen of billy goats evaluated through progeny testing contributes greatly to the increasing performance of the herds.

In France, herds with more than 50% of goats from animal insemination have an average controlled milk yield 25% higher (or 190 kg) than those from farms making little use of animal insemination.

### HIGH PACE AND REGULAR GENETIC PROGRESS



Source : Institut de l'Élevage / INRA 2012

# Alpine

## THE BREED IN FRANCE

450,000 goats  
1,354 flocks under official milk recording system  
166,282 goats under official milk recording system  
45,639 inseminations

## FORMAT

Adult goat weight: 50 à 70 kg  
Adult buck weight: 80 à 100 kg

## TRAITS\*

Milk yield: 915 kg in 296 days  
Fat content: 3.76 %  
Crude protein content: 3.47 %

\* Official milk recording results 2012  
Institut de l'Elevage & FCE- Institut de l'Elevage & FCE



## Traits and performances

The Alpine goat originated in the Alps, but has since spread to all the French goat-farming regions to become the most popular goat breed in France, accounting today for 55% of all goats under official milk recording system.

The mid-framed Alpine adapts to all dairy goat management systems: indoor, grass-fed or rangeland's mountain. It has lost none of its hardiness and has kept strong-boned, well-balanced feet and legs.

They are short-haired, and generally tan-shaded (brown-colored with black feet and a roach of black hair along the spine), although Alpines can demonstrate many shadings and color combinations.

**The Alpine has a large udder, well-attached at both fore and rear, gifted with soft fine skin that draws back well after milking.**

The teats project clear from the udder, and are aligned parallel and pointing forward, which makes the Alpine ideally suited to mechanical milking.

## MORE

**Organisation et Entreprise de Sélection Capgènes**  
[www.capgenes.com](http://www.capgenes.com)

**Sersia France**  
[www.sersia.fr](http://www.sersia.fr)

## Selection

A stringent breeding programme has been up and running since the early 1970s, coordinated by Capgènes and federating all the relevant goat-sector partners for both the Alpine and Saanen breeds.

Selection criteria primarily targets milk and contents production (quantity of protein and fat per goat and per lactation, plus milk protein and butterfat content) in order to quantitatively and qualitatively improve cheese production per goat. Other selection criteria were subsequently integrated, such as morphological criteria and  $\alpha$ S1 casein, to enrich the present program.

**Capgènes identifies the best buck dams within the selection flocks under official milk recording system and programs artificial inseminations with the best bucks available.**

Males produced from these planned matings are then examined and tested through a series of stages (on-farm selection, semen production centre, individual on-station testing, progeny testing).

The 30 or 40 best bucks successfully passing these tests are shortlisted for artificial insemination.

Semen from these improver bucks can then be propagated by artificial insemination cooperatives, operating at national or indeed international scale: **25 countries, mainly in Europe, Asia and South America, use over 9,000 doses of French buck semen every year. What they get is unparalleled quality genetics and guaranteed livestock health and performance quality.**

# Saanen

## THE BREED IN FRANCE

350,000 goats  
1,057 flocks under official milk recording system  
124,040 goats under official milk recording system  
30,183 inseminations

## FRAME

Adult goat weight: 50 à 90 kg  
Adult buck weight: 80 à 120 kg

## TRAITS\*

Milk yield: 996 kg in 313 days  
Fat content: 3.55 %  
Crude protein content: 3.33 %

\* Official milk recording results 2012  
Institut de l'Élevage & FCE- Institut de l'Élevage & FCE



## Traits and performances

The Saanen, named after the Saanen valley in Switzerland, is mainly farmed in central, western and south-eastern France.

This stocky, big-boned all-white goat boasts a mild temperament. It has excellent dairy traits, and it's suitable for all kinds of farming systems, including intensive set-ups.

The udder is well-attached and has a very large top section. It has a good feet & legs on a well-balanced frame. The Saanen counts 350,000 goats in France, ranking second most popular breed, representing 40% of the national herd stock. Saanen is also the world's most widely distributed dairy goat breed.

## MORE

Organisation et Entreprise  
de Sélection Capgènes  
[www.capgenes.com](http://www.capgenes.com)

Sersia France  
[www.sersia.fr](http://www.sersia.fr)

## Selection

The breeding programme coordinated by Capgènes encompasses both the Alpine and Saanen breeds. The scheme aims to quantitatively and qualitatively improve cheese production per goat, by working on quantity of protein and butterfat produced per goat and per lactation and milk protein and butterfat content as chief selection criteria.

The selection flocks counts 100,000 goats under official milk recording system, together with their pedigree recording. Every year, the best goats of the selection flocks are shortlisted for around 1,000 planned matings via artificial insemination with breed-improver bucks.

Males produced through these planned matings are examined and eventually selected to enter in semen production centre, where they will be further selected on sanitary and overall health status criteria.

At this stage, the best bucks are monitored for individual performances in on-station testing, in order to shortlist which males qualify to produce frozen insemination-ready semen straws, and then progeny-tested to calculate the core composite dairy merit indexes: milk index, milk protein content index ('ITP'), milk butterfat content index ('ITB'), total protein index ('IMP'), total fat index ('IMG').

Based on the level of genetics achieved, the 30 to 40 best bucks are selected as artificial insemination seedstock. Every year, 45% of all goats in the selection flocks are inseminated, which ensures that genetic improvements get widely propagated, while offering farmers guaranteed animal health and quality genetics.

This breeding program has had visible positive impacts: over the last decade, genetic improvement has added 13 kg of milk per lactation and per year, together with an average 0.1g/kg year-on-year increase in milk protein and butterfat content.

The planned matings recommended through the scheme also integrate genetic variability in addition to raw genetic improvement in order to secure long-term sustainable effectiveness for the selection programme.

# Conservation breeds

## Angora goat



**THE BREED IN FRANCE (2012)**  
2,500 goats - 35 flocks

Track records traces Angora goats back to 11th-century Turkey, but it was in the 19th century that raw Angora fiber became popular in Europe (principally England and France) as source material for the Mohair industry.

France-line Angora goats were originally imported in the 1980s, to enter an intensive breeding program focusing to improve the quality of the natural Mohair fiber (fineness, consistent quality, kemp-free). In France, Angora goats are shorn twice a year, yielding an average of 5 kg of raw hair per year. Angora product quality is protected under a quality stamp called "Mohair des Fermes de France," implemented through the coordinated efforts of 200 Mohair-sector farmers.

[www.capgenes.com](http://www.capgenes.com)  
[www.mohair-france.com](http://www.mohair-france.com)

## Corsican



**THE BREED IN FRANCE (2012)**  
28,000 goats - 200 flocks

Corsica has managed to safeguard the population numbers of its native Corsican goat by clinging to its island identity: 98% of goats in Corsica are Corsican breed. The Corsican is a long-haired goat whose fleece is found in a range of colors. It is robust, agile and mid-framed - perfectly adapted to its native scrubland environment.

Corsican goats produce exceptionally protein-rich milk that is used to manufacture numerous Corsican cheeses, including the Brocciu, with Protected Designation of Origin (Appellation d'Origine Contrôlée - AOC).

A breeding programme was launched a decade ago to improve on milk quality while maintaining its hardiness and frame.

## Des fossés' goat



**THE BREED IN FRANCE (2012)**  
670 goats - 121 flocks

The 'des Fossés' goat is indigenous to the Normandy-Brittany area, where it was used for all-purpose subsistence farming, providing the family with milk, meat and hide - and even for drought by the poorest families.

This docile, light-framed goat with fairly long hair in a range of colors almost become extinct, but has since been rescued thanks to a dynamic breed conservation programme launched 5 years ago.

[www.chevredesfosses.fr](http://www.chevredesfosses.fr)

## Poitou goat



**THE BREED IN FRANCE (2012)**  
2,600 goats - 122 flocks

The Poitou goat used to offer bright business for local cheese cooperatives in its home region of the Poitou-Charentes, until an outbreak of foot-and-mouth disease in 1920 decimated the population. Poitou goat herd numbers did not pick up again until the 1970s, when a breed conservation programme was initiated. The Poitou goat has an instantly-recognizable long-haired coat known as "cape de Maure" (black or dark-brown with white coloring on the face, underbelly and inner legs and a white stripe either side of the bridge of the muzzle). Most Poitou goat farmers process the milk on-farm to draw added value from the breed's dairying qualities ( $\alpha$ S1 casein-rich milk content).

[www.chevre-poitevine.org](http://www.chevre-poitevine.org)

## Pyrenees' goat



**THE BREED IN FRANCE (2012)**  
3,000 goats - 180 flocks

The Pyrenean goat was once found across the entire Pyrenean mountain range, yet by the early 1990s it has practically disappeared due to the combined effects of rural exodus and competition from selection-improved breeds. Regional-level action from farmers' organizations and conservation groups managed to bring about a turnaround via a breed conservation initiative launched in 1993.

The Pyrenean is a mid-framed, relatively heavy-build goat, long or semi-long-haired with a coat of varying colors, often with mottling.

The Pyrenean is generally bred semi-free-range, under meat or cheese production systems.

[www.chevredespyrenees.org](http://www.chevredespyrenees.org)

## Rove's goat



**LA RACE EN FRANCE**  
7,918 goats - 143 flocks

The Rove is found mainly in south-eastern areas of France.

In the past Roves would traditionally flock alongside large sheep flocks climbing up to the Alpine mountain pastures, serving as guide while providing the shepherds with a welcome additional source of milk.

Nowadays its main attraction is that it produces heavyweight kid goats and can be milked to make "Brousse du Rove", a cheese that has been filed for Protected Geographical Indication (IGP) status. The Rove is most commonly a deep red color, occasionally with white mottling. Its most recognizable feature is a highly developed set of horns.

[www.chevredurove.com](http://www.chevredurove.com)



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ISBN 978-2-36343-490-6  
Ref: n°0014102001  
December 2013

With financial support from:



CNPA

