

**HERITAGE SHEEP**

**Study of a hardy meat breed: the Causses  
du Lot**

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## **I. The Lot department: a land for sheep farming**

### **A. Sheep farming: a tradition anchored in the department**

Over 25 % of the French sheep livestock are raised in the Midi-Pyrénées region. The department (the French basic administrative entity) of Lot, with 1 100 farms and 250 000 ewes, is the second department of France by its number of meat ewes, and the first department within Midi-Pyrénées. The majority of the farms are specialized and the average flock size is ranged between 300 and 1 000 ewes. 50 % of the Lot department is used by sheep farming system and the sheep industry represents 8 % of the department turnover.

This dominant position of the department in sheep breeding is explained mostly by its climate conditions and landscape. The “Causses” are a 8 000 km<sup>2</sup> limestone plateau near the west of the Massif Central. This dry and stony plateau, covered by dry lawns and oak woodlands, is not favourable for crop or intensive forage production but in the opposite is favourable for sheep breeding.

The sheep production of the Lot is very organised, 80 % of the lambs are sold to 3 Producers Organisations (OP): CAPEL Ovin (110 000 lambs), GEOC (62 000 lambs) and ADEL 46 (22 000 lambs). 2 local networks of slaughter, ARCADIE Sud-Ouest and SA DESTREL, work with one slaughter specialized in sheep in Gramat which received 5 000 tonnes of carcasses.

The production of sheep meat is under quality official signs with 2 Labels Rouges: “Agneau Fermier du Quercy” and “Agneau Fermier des Pays d’Oc”. 52 000 lambs per year (= 1 000 lambs per week) are commercialised under quality official signs.

### **B. A local hill breed adapted to its environment**

#### 1. The Causses du Lot breed: origin and description

The Causses du Lot or Caussenarde du Lot (CDL) is a breed of the Central Pyrénées which is (and has been raised) mostly in the Lot department, on the limestone plateau, hence its name. The breed is tall, slender and white with black eye patches. Neither the males nor the females are horned. It has good fleece coverage, and the legs also covered (figure 1).



**Figure 1 : : Causses du Lot ewe**

## 2. A breed very localised and dominant in the territory

250 farms are registered in the Lot, with 106 000 ewes CDL : almost 60 000 are pure-bred and 40 000 “F1-46” which is a cross between a CDL ewe and an Ile de France (OIF) ram. The flocks average size is 580 ewes. 38 % of the farming system in Lot are specialised in sheep breeding (figure 2). Almost all the farms are family transmitted.

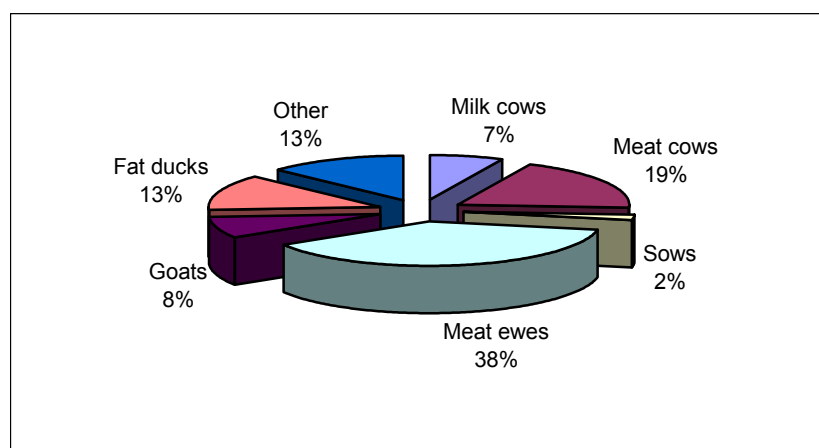


Figure 2 : Animal productions in the Causses

The breeds “Blanche du Massif Central” (BMC) and “Lacaune” are also raised in the department. These 2 breeds are included with the CDL in the Label Rouge “Agneaux Fermier du Quercy”. However they do not represent a threat for the CDL which is still raised in majority and better adapted to the Causses environment.

Being on a very small territory is both an advantage and a handicap. It's an opportunity because the local sheep industry managed to include all the protagonists to create an integrated organisation, from the breeders to the OP as well as the slaughterhouses. The inconvenient is the organisation scale, since it cannot be expanded beyond the department and because of its very small size its voice cannot be heard with the Europe Community. Actually, the farmers have a tendency to be even more geographically concentrated since most farmers are located around Gramat city. This geographical isolation plus the fact that farmers have the habit to exchange large number of animals between them make the breed extremely vulnerable to any disease outbreak.

## 3. The Causses du Lot: a hill ewe with many qualities

Its main capacity is probably its ability to utilise sparse and poor quality forage, and also to regain quickly its body weight after period of food deprivation. The breed is fed mostly by grazing on the hills but when housed it is complemented with hay and cereal. Proteins are coming from the cultivation of alfalfa on the “Causses” soils (chalk).

The ewes mature early and is aseasonal. This aptitude is used by the sheep industry to fill a gap in the market when the lamb supply is poor. It is also an advantage for the breeders, since lambing dates as well as work and funds are well spread throughout the year.

The breed has also a good milk value for a meat breed. It is a good walker and is resistant against piroplasmosis, a disease carried by ticks and fatal for other sheep.

#### 4. Flocks in an accelerated lambing program

The CDL is well suited to semi-outdoor management. Ewes are outdoor or housed depending on their physiological stages: breeding or gestating ewes are kept outdoor to graze while at lambing ewes are kept indoors. During dry season (august mostly), flocks are in woodlands to graze on the remaining vegetations that was protected from drought by the trees.

Female lambs are bred for the first time when they are between 10 to 12 months old. Rams are left with the ewes during 35 to 45 days (2 to 3 heat cycles). In some farms, ewes are gathered to make a gestation diagnosis and then the flock is split into 2 groups: ewes with a single lamb and ewes with twins, which will receive a higher feed intake. Just after lambing, ewes with twins are parked in single pens so that they can take care of their offspring. Average culling time ranges between 7 to 10 years old.

In large flocks, they can be 2, 3 or even 4 lambing dates spread throughout the year. Different lambing systems exist:

- in a “3 lambing in 2 years” system, lambing times are usually in August, November and March;
- 4 lambing in 3 years;
- 1 lambing per year and per ewe. In this case the flock is split into 2 groups to have 2 lambing periods, one in spring and one during fall season.

#### 5. A technical support favourable to the breed

Many organisations are offering technical support to the breeders:

- The Selection Organism (OS), the Breed Society, (ex UPRA Union Nationale de Sélections et de Promotions des Races), is in charge of the flock book of the breed (cf. II.B.)
- The local Agriculture Board does administrative accompaniment and specific follow-up on some topics such as the construction of a new farm building according to the European norms.
- The OP give technical help on flock management and ensure the commercialisation of the production (cf. III.C.)
- The sheep Trade Union of the department supports farming mostly thanks to its communication around sheep farming in the local stores. They organise also training programs for farmers, and they can help individual breeders by analysing their farming system.

#### 6. Better communication is still possible

The Parc Naturel Régional des Causses du Quercy, created in 1999, covers 1/3 of the Lot department and includes 70 to 80 % of the breeders members of the CDL sheep industry. Its purpose is to protect the heritage and ensure the public welcome, education and information in the Parc.

So far, the sheep industry and the Regional Park are not working very closely, which is an obvious waste in the breed communication: the Park draws a lot of tourists who could be potential consumers. The Park is also a very good opportunity to communicate about the positive impact of sheep farming on land biodiversity and landscape management.

## II. A breeding plan that meets the sheep industry requirements

### A. History and evolution

1955: Creation of the Flock Book of the breed Causses du Lot.

1974: Creation of the UPRA Causses du Lot.

Implementation of breeding selection program.

*Aims: Improve prolificity and milk value.*

*Keeping the aseasonality of the breed*

1976: Building of the Artificial Insemination (IA) Centre in Fontanes du Causse and of the Breeding Centre (CE) for young rams.

1986: Implementation of a progeny selection scheme that includes on-farm testing of the progeny and organised mating with rams favourably tested.

*Aim: Improve prolificity and milk value.*

1993: Reorganization of the UPRA Causses du Lot with implementation of the two-step breed selection scheme.

*Aim: Ensure the renewal of 100 00 meat flock ewes in order to achieve the best possible guarantees with regard to genetic and health status.*

2001: Implementation of the scrapie genetic scheme.

*Aim: Select scrapie resistant animals*

2006: New French agricultural law - "LOA"

2008: Creation of the OES "OVILOT" which replaces the UPRA

### B. presentation of "OVILOT"

Starting January 2006, it became mandatory according to the "LOA" to create an "OS" (Selection Organism) with a Selection Company (ES) to replace the "UPRA". The OS are in charge of the Flock book and the breeding programmes whereas the ES regroups the IA Centre, the rams breeding centre (ex "CE") and the individual testing station.

In the case of the CDL breed, it was chosen to group also the OS and the ES in order to make an "OES", which name is OVILOT. It manages the CDL breed flock-book, coordinates all the genetic actions and plans the production as well as the commercial actions.

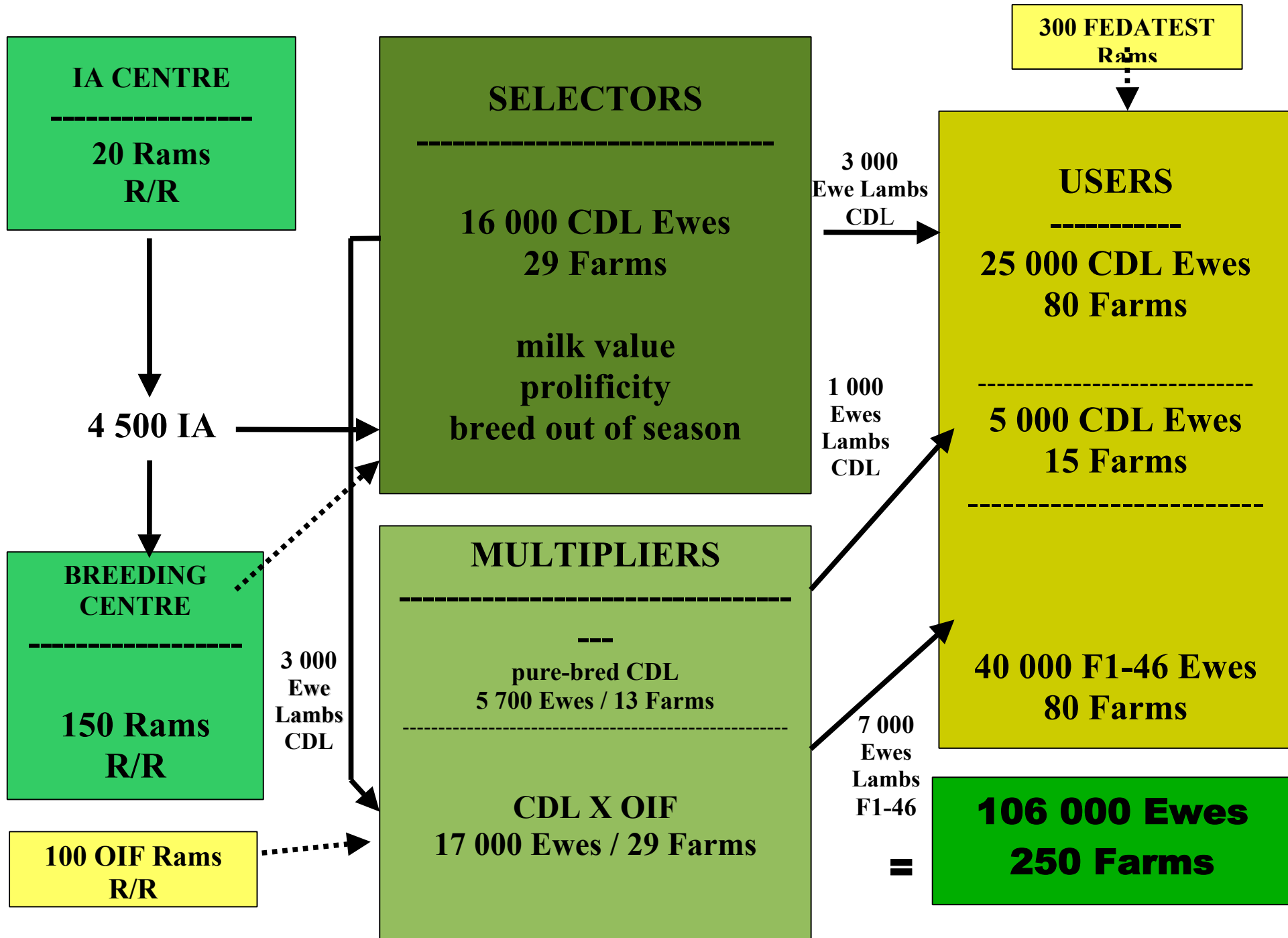
For the breeding plan, OVILOT has to ensure the renewal of 100 000 meat flock ewes in order to achieve the best possible guarantees with regard to genetic and health status. The OS is divided into 3 groups of 38 900 ewes (figure 4):

Groups I and II are breeders of the selection nucleus. The flocks are in pure-bred and these groups are in charge of improving the maternal abilities of the breed (prolificity and milk value). The breeders are members of one of these 2 groups according to their results in prolificity and their motivation to accept the technical rules asked by the selection program.

The group I is constituted by the selector breeders (30 farmers and 16 500 ewes in 2007). They are in charge of creating and distributing the genetic progress. Each farmer is engaged to:

- do a "F1" performance recording (\*),
- use AI for progeny testing,
- agree to use sire males on their sire dams ewes, and to sell their offspring to the breeding centre if it is a male,
- produce the replacement females for Group III farmers.

Figure 4: Production scheme and 2-step breed selection scheme in the Lot



(\*) Performance recording is done by technicians from the “department” Agricultural Board. “F1” performance recording includes the registration of the ewes reproduction characteristics: fertility, prolificity, breeding out of season, birth mortality and maternal aptitudes. For each farm the following parameters are registered:

- National permanent identification of the animal;
- Dates and reasons of arrival/exit in the flock (birth/purchase vs natural death / culling / sell etc.)
- Mating season dates and identification of the rams used by ewe;
- number and identification of the number of lambs born per ewe;

The controller comes three time per lambing season: during mating season, 1<sup>1/2</sup> to 2 months after the first birth, and at the end of the lambing season. During lambing season each lamb will be weighted once between 21 and 46 days old in order to determine its weight at 30 days of age.

Group II (14 farms and 6 900 ewes in 2007) produces pure-bred females sold to commercial flocks. The CDL rams are pure-bred and are bought from the breeding centre. Each farmer has to be part of the “F8” performance recording system, i.e. the flock inventory, with their pedigrees, and all reproductive events. No weighting is performed on the lamb for this type of control, but it allows to have an estimation of the ewes reproductive aptitudes. As a habit Group II is usually a way to include new farmers to the breed, who will afterward decide if they want to join Group I or III.

Group III (27 breeders and 15 500 ewes in 2007) is the group of the multiplier breeders. Their objective is to produce a F1-46 female from a CDL ewe of Group I and an OIF ram. F1-46 females are sold to user breeders who make commercial crossing from the two-step breed selection scheme to produce F2 meat flock lambs. Breeders must make F8 performance recording.

#### **D. A breeding plan to improve the CDL’s milk qualities and carcass traits**

The selection nucleus is formed by the Group I and II, and the animals within these groups in the flock book to ensure that they are pure-bred. The best ewes that will be the sire dams are identified thanks to the performance recording system, mostly within Group I.

The elite young males are then raised in the breeding centre, where their own performances are recorded. Afterward they are progeny tested on ewes from the selection nucleus. The best progeny tested rams tested are then selected to be the sires rams and bred with the sire dams. 90 % of these mating are AI.

The genetic progress is distributed thanks to AI (only elite rams are collected), by selling the best rams from the breeding centre once they are tested, and mainly by selling ewes from the selection nucleus to other breeders.

Breeders want to emphasize progresses on the following traits:

- maternal aptitudes: prolificity and milk value, thanks to the on-farm progeny testing program.
- conformation of the commercialised lambs. This improvement is possible mainly thanks to the production of a “F1-46” female (i.e. the cross between a female CDL and an Ile de France ram), which is then used in commercial crossing with a meat breed (Berrichon du Cher, Rouge de l’Ouest, Suffolk...) to produce well conformed lambs.



### 1. Progeny testing allows to improve the CDL's maternal aptitudes

In 2007, 201 rams coming from the Group I were raised in the breeding centre from the age of 4 months old till 10. At the end of the process each ram has a parental genetic evaluation and a phenotypic evaluation (development and conformation). According to their results, the young rams were split in different groups:

- 59 were culled or died,
- 83 were sold to Group I and II,
- 23 were sold to others users,
- 36 were selected for the 2008 progeny testing (6 families of rams and 6 rams per family).

From the 36 tested candidates, an average of 3 rams/family can be successfully collected for AI. The ones with poor semen quality are sold. AI are then performed on 20 farms from the selection nucleus, and the females offspring are then recorded for their milk value and prolificity. Once tested, the best ram from each family is registered as an Elite ram and future sire ram, while the other ones are culled.

### 2. A breeding plan that produces well conformed lambs throughout the year

On the EUROP scale, pure bred CDL lambs are classified "O" on average, with thin legs carcasses. Obviously meat breeds perform better on this traits. To produce well conformed lambs while using the CDL's qualities, the OS created a two-step breeding plan similar to what can be found for most breeds in the UK. First step is to create a "F1-46" female, a cross between a Ile de France ram and a CDL ewe, which combines the qualities of the two breeds. These females are then used in commercial crossing with meat rams and produce lambs that meet the requirements of the market.

#### **Causses du Lot ewes**

Breed adapted to its environment  
Full outdoor breed  
Aseasonal  
Maternal instinct

**X**

#### **Ile de France rams**

Meat breed  
Well conformed  
Aseasonal

⇓

#### **"F1-46" ewes**

Prolific (1.50 to 1.90)  
Adapted to full outdoor and  
housed management  
Aseasonal  
Maternal instinct  
Milk value

⇓

#### **F2 lambs**

Conformed lambs  
Rapid growth  
Hardy

**X meat rams**  
(Berrichon du Cher Rouge de  
l'Ouest...)

**Figure 3: The two-step breeding plan**

### The Ile de France rams are carefully selected

Ile de France (OIF) rams are selected for their carcasses traits qualities but also for their aseasonality (figure 6) since the sheep industry wants to supply the market throughout the year. They are selected on their prolificity breeding value and parental milk value.

### The F1-46: producing lambs that meet the market demands

The F1-46 have a lot of qualities (figure 7). They are aseasonal which allows to supply the market at time when the sheep production is usually low (October-November). They are probably resistant to piroplasmosis, an essential condition to live in the Causses woods. Above all, they have maternal instinct and good milk value. Lambing is easy and does not require particular watch. Their F2 lambs are well conformed with a rapid growth. They are hardy, thanks to heterosis effect. This two-step breeding program allows to meet the main market requirements which are well conformed lambs produced evenly all year long.



**Figure 4: F1-46 ewe and its offspring**

## **III. A dynamic, innovative and closely knit sheep industry**

### **A. A main objective: marketing the local sheep production**

During the XIX<sup>th</sup> century, the CDL was bred mostly for its wool (till 3 kg per fleece). At the beginning of the XX<sup>th</sup> century, sheep farming was transformed towards meat production. The crossing with foreign breeds failed and a strict selection was put into place to obtain fleshier lambs that were slaughtered at 10-12 months of age when they reached 50 to 60 kg. Ewes were also milked, and their production was mixed with goat milk to make cheeses sent to Paris or used to make Roquefort (a famous French cheese).

After the Second World War, sheep breeding in the Lot was particularly dynamic thanks to motivated breeders and a powerful trade. The Lot lamb was actually a luxury item in Paris. Most farmers kept the CDL breed, and sometimes they were crossing it with “Berrichon du Cher” or “Ile de France” (both a meat breed) rams.

In the eighties, thousands of lambs from France or East Countries were brought in the Lot to be slaughtered there so they could be sold as “lambs from the Lot department”, which led to a depreciation of the name. Meanwhile, because of new EC rules, the prices of lamb went down drastically in October 1980. This tendency was also increased by a higher number of importations.

To regain the market and restore the reputation of the Lot lamb, the Lot sheep trade union sheep created in April 1982 the “Association des Eleveurs d’Agneaux Fermiers du Lot élevés sous la mère” (Association of Lot suckling lambs farmers). The same year a regional label (for the region Midi-Pyrénées) was obtained for the “Agneau Fermier du Quercy”

(Lamb from Quercy farms). This label was actually the first one delivered for sheep meat in France. Another label of higher recognition, the “Red Label” (a national quality label) was obtained in 1990 for the “Agneau Fermier du Quercy”, as well as a Protected Geographical Indication (IGP) “Quercy” in 1996. The Label Rouge is a proof of quality whereas the IGP emphasises on the meat origin.

**B. A production of young, heavy, hardy lambs with a label**

The two-step breed selection scheme permitted to meet the market requirements and more particularly the demands from large retail outlets that look for a regular offer, great conformation and homogeneous lambs.

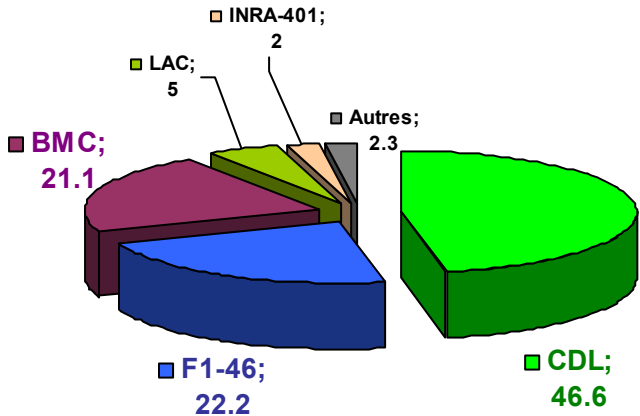
The Label Rouge “Agneau Fermier du Quercy” allows the sheep industry to be acknowledged with enough power that they can negotiate large retail outlets for higher and more regular prices throughout the year.

1. An inter-breed Label Rouge based on the two-step breeding program

The Label Rouge “Agneau Fermier du Quercy” specifications are based on livestock management. To benefit from the Label Rouge, lambs must be raised in the same farm at all time, be suckling lamb (no artificial suckling), weaned from their mother at 70 days minimum and slaughtered between 60 and 150 days of age. The lamb must weigh between 12 and 22 kg, with a fattening stage of 2,3 and a U, R or O conformation. Its meat must be pinkish, light with white and consistent fat.

The lambs are fed with cereals as early as possible and after being weaned they are fed indoors. This kind of fattening permits the lambs to achieve marketable weight in the optimum time but leads to an increased charges. Young slaughtered lambs have a light pinkish and stretch meat with not too much taste; all characteristics looked upon by the French consumers.

This label is not a breed label: it takes into account the CDL and F1-46 but also all the lambs from commercial crossings between the CDL and another breeds (Lacaune, Blanche du Massif Central = BMC...) including meat rams (Berrichon du Cher = BCF, Charollais...) (figure 8).



**Figure 8: Distribution of the Label “Agneaux Fermier du Quercy” members by breeds**

The majority of the labelled lambs are “F1-46” then industrial crossings lambs, pure-bred CDL lambs being a minority.

**Table 1: Prélabellisation<sup>1</sup> rate of lambs in 2006**

Breed of the ewe	CDL			F1-46	BMC
Breed of the ram	CDL	BCF	OIF	BCF	BCF
Prélabellisation rate	55 %	82 %	87 %	87 %	81 %

<sup>1</sup> cf. following §

To produce lambs throughout the year, an incentive to breed out of natural lambing season was put into place thanks to the payment of supplementary prices by the OP. However some efforts still need to be made since 70 % of the Label lambs are producing during the season when the offer is higher than the demand and 30 % in out of season when the offer becomes scarce and the prices are the highest.

### 2. A label which depends on offer and demand

There are several stages before a lamb can be branded as “label”:

- “Prélabellisable” lamb (93 % of the lambs produced by the Label members): it is a lamb which leaves the farm and enters the slaughterhouse. It is prélabellisable if the speculations are matched.
- Prélabellised lamb (74 %): the slaughterhouse determines if the lamb is prélabellised according to its conformation, its fattening stage, the meat colour...
- Labellised lamb (58 %): it is the lamb sold under Label Rouge. This stage depends on the demand of Label Rouge by the market. Since the lamb meat is fresh, never frozen, it is impossible to store in order to answer the fluctuating needs of the market.

### 3. A payment system which tries to be fair

When a lamb is labellised, the difference between normal prices and label prices (it varies from 0.30 to 0.40 €/kg carcass) is not directly paid to the farmer but to a collective funding that evens-up the number of labelled animals paid per farmers.

For instance, a farmer who sells 10 prélabellised lamb including 5 that will be labellised will be paid as if only 2 lambs were labellised. On the other hand, if no lambs of his were labellised, it will benefit from the system. This payment was put into place to avoid that a breeder will be penalized because of a conjunctural decrease in the demand of Label Rouge.

Then, a financial realignment system was established so that every member of the sheep industry and particularly the selection nucleus would benefit from the Label Rouge profits.

## **C. The “Agneau Fermier du Quercy” label : an industry structured and grouped in a restricted territory**

The sheep industry that groups breeders, OP, and slaughterhouses is very organized and localised in a very small territory: the Lot department (figure 9). This proximity between the different players allows a better communication and coordination. It also limits the amount of time and kilometres when moving the lambs, which reduces charges and the stress linked to transportation.

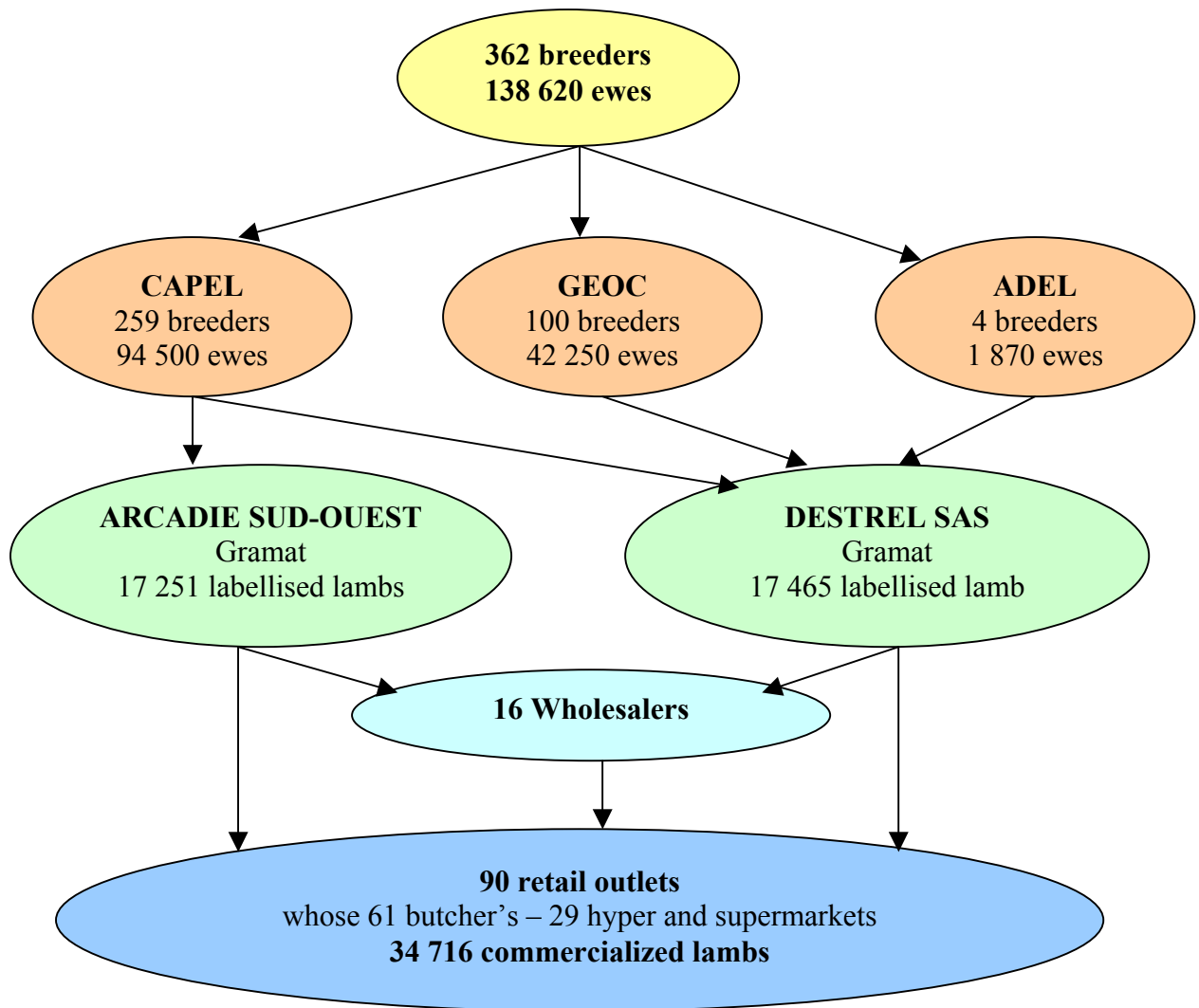


Figure 9 : Agneau Fermier du Quercy network in 2007

### 1. Technical and commercial support for the breeders

There are 3 OP (Producers Organisations) for the Causses du Lot, which not only are in charge of buying and selling the animals but also gives technical advises on sheep production. They also find the best quality/price for agriculture supplies such as seeds, fertilizers, feedstuff etc....

The OPS contribute to the promotion and the commercialisation of the lambs. They ensure the breeders a regular demand and are in charge of negotiating prices with the slaughterhouses every week. The prices are fixed according to an evaluation board. The OP's members have a guarantee of price, production and payment.

The OP's members pay an annual subscription composed by a set base and a variable part that depends on the ewes number and the number and the kind of technical services required. With the commercial OP, a deduction is made in all lambs and ewes bills. The OP director is appointed by the board of directors. The communication between OP and breeders is made by technicians visits, area meetings, trainings, information forms, letters...

## 2. The “Agneau Fermier du Quercy” is marketed countrywide

95.4 % of the Label members lambs are slaughtered in the city of Gramat. In 2008, “Agneau Fermier du Quercy” were sold in 110 different outlets all over France, of which 67 % are butchers and 33 % supermarkets. 15 % of the market is in local: 16 outlets (7 butchers and 9 supermarkets) are based in the Lot département.

## **IV. A sheep industry in constant development**

### **A. Implementing the scrapie resistance program**

In 2001, the OS started a systematic genotyping programme for the Breeding Centre (BC) rams: only R/R rams were selected and therefore the frequency of the ARR allele in the breed increased quickly. The R/R lamb percentage went from 9 % in 2002 to 45 % in 2008 (table 3).

**Table 2 : Evolution of the ARR frequency**

	2001	2002	2003	2004	2005	2006	2007	2008
<b>Total nb genotypes</b>		1 323	1 297	1 093	959	823	666	527
<b>Nb R/R Lambs</b>		125	160	191	183	267	288	236
<b>Nb R/R Lambs in BC</b>		114	147	139	144	177	201	174
<b>ARR frequency in the genotyped lambs</b>	0.15	0.16	0.25	0.57	0.59	0.66	0.72	0.72
<b>R/R Lambs percentage</b>		9 %	12 %	17 %	19 %	32 %	43 %	45 %

Other factors contributed to these very good results:

- An exclusive use of R/R IA rams starting in 2003;
- An increased use of AI in the farms to create resistant replacement females. The R replacement females were bred in 2006 with R/R lambs, increasing the probability of having homozygous lambs;
- Technical support is offered by the National Institut of Agricultural Research (INRA) to target in an easier way R/R males candidates.

Most of the genotyping program was funded by national subsidies. This programme started in 2002 and was initially planned for 4 years, then it was continued for 3 years from 2007 to 2010. Predictions greatly decreased the genotyping costs. As an example, the cost of entering a R/R male in the breeding centre went down from 194 € in 2003 to 60 € for the ones born in 2008.

### **B. Being part of the latest research development: livestock animal behaviour**

Animal behaviour (calm/on edge) has an impact on breeding management, production results and farmer labour time. For instance, it is more difficult to supervise or manage jumpy ewes during lambing.

An experiment has been made in 2007 to know the genetic effects of rams behaviour. This experiment, led by the INRA, has been realised at the breeding centre and will be achieved during winter in 2009. It is hoped that a heritability will be estimated from this study that can therefore be used in selection programs.

This example is an illustration of local industry that always try to improve and remain dynamic .

### **C. How to better market fleeces ?**

The CDL has a good fleece with kempy wool. This characteristic is used for walls or roofs thermal insulation as well as filling up mattresses.

Each year 200 tonnes of fleece are collected for the CDL and “F1-46”. Most of the fleece are exported to China or Japan for textile industry. Nowadays shearing a sheep is a charge for farmers: in 2008 a fleece was sold 0.40 €/kg, for an average of 2 kg per fleece, while shearing is billed 1.25 € per ewe.

Some development are expected thanks to the creation of a society specialised in the use of wool for thermal insulation. It is hoped that the price of fleece will increased at least to match the shearing price, and even to be profitable at long term.

## **V. High concerns about the future of the sheep industry**

### **A. Decreasing subsidies**

A study performed on 43 farms about the lambs production cost in 2006 showed that it was equal to 115 €, while the average lamb selling price is equal to 88 €. Therefore without European subsidies, farmers income is negative.

Since the last Common Agricultural Policy, the “sheep compensative subsidies” was replaced in 2006 by the “ewe and goat allowance” (PBC). The PBC is based on the average number of sheep raised in each farm between 2000 and 2002. It obviously penalizes any farmer that increased its flock since 2002.

Before the reform, the selectors breeders get a genetic subsidy for sheep from UPRA members, those helped the beginning and the maintaining of the selection scheme. Currently, this subsidy was replaced by a less important subsidy paid for the purchase of rams tested and evaluated at FEDATEST. In view of this situation, some professionals are afraid of a lack of motivation from selectors breeders.

Local subsidies are also decreasing: farmers from the nucleus group where benefiting from financial helps coming from the Flock Book that was given to any members part of the selection scheme. This funding is replaced by a single subsidy paid for the purchase of progeny tested rams.

While the total amount of subsidies receive by farm (including others not related directly to sheep farming such as agro-environmental ones), global costs (such a gas and feedstuff) are increasing drastically. Some farmers tried to grow cereals since the prices increased so much, however the Causses is not a land fit for crop production. One of the future challenge of the breeders association will be probably to improve the feed efficiency of the breed.

### **B. The sheep industry: how to resist in a difficult context**

The European production of sheep meat goes through a difficult period. The numbers of sheep in France have decreased of 15 % between 1996 et 2006, mainly because of the increase of raw material. Raising housed lambs is not profitable enough and farmers use their lands instead for crop or beef cattle.

Sheep production decreased in Lot too but in smaller proportions: it went down by 7%. This trend is explained by a local will to keep sheep farming and by an environment unfavourable for any other kind of agriculture.

Sheep breeding is a way to do landscape management and to protect the environment. Maintaining sheep farming is essential in the Causses since one of the few ways that exists to promote the land. The Causses is one of the last dry lawns places in France and the CDL takes part of its preservation. Without sheep, the Causses will become woodland. Moreover, sheep farming remains important for the economy of the department.

### **C. Being a farmer: a status at stake**

Being a sheep breeder is a tough job and working conditions are hard. It demands both a high number of hours of work required on the farm, to guard the flock as an example, and a high level of technical competences, for a rather low income.

For these reasons being a sheep farmer is not attractive, which leads to a constant ageing of the farmers. Most farmers children are looking for less wearisome and more lucrative jobs.

Between 2007 and 2008, about fifty breeders stopped their activity, mostly to retire, and they were replaced by only fifteen young farmers. According to Mr André DELPECH, chairman of the Union Trade of Lot, this trend is going to increase.

The CDL organisation is well aware of this problem and they are trying to set up new techniques on how to manage a sheep farm. Farmers must improve their organisation, simplify some tasks, and decrease their working time by hiring labour force. As an example, less time can be spent in checking the flock, and ewes can be fed the same quantity even if they have twins, as long as you accept to have a higher rate than average for lamb mortality.

Some improvements will be necessary in the technical and economical management of the farm. Lot of farmers don't know how calculate the production cost of a lamb or if they do, they are quite discouraged by the results ! Help should be provided thanks to the creation of the OES. One of its task will be to report accurate technico-economical surveys for each farm, and to help to identify ways to make farms more profitable. As an example most breeders have to much farm machinery, which is costly to buy and to maintain, and it would be better for them to be part of a machinery cooperative for instance.



## Conclusion

Historically, the Lot department is a sheep land and is the cradle of the Causses du Lot breed, which is a local hardy breed well adapted to its environment. This breed has many qualities: it is aseasonal, it has good maternal aptitudes and instinct, and it is resistant against piroplasmosis.

Tremendous efforts were made to organise the local sheep industry which led to the maintenance of the breed at high numbers, with the implementation of a successful genetic breeding program and meat production. The level of organisation of the entire industry, from the breeders to the slaughter houses, in such a small territory is unique in France.

However, the future of the local sheep industry is not certain. The breed is highly geographically concentrated therefore it is extremely vulnerable to any contagious disease outbreak. On a more general level, common to sheep production all over France, the decrease of the subsidies coupled with an increase of the expenses (gas and cereals mostly) jeopardize greatly most farmers incomes. Also, since the amount of work needed in the sheep production is not matched by a interesting income the number of new farmers is much less than the numbers of farmers that are retiring. However since there is no agricultural value to the “Causses”, the sheep desertion will lead to the replacement of unique landscape of dry lawns by woodlands of poor biodiversity interest.

To confront this crisis, some changes are necessary. A better technical and economical management could give some solutions to improve the working environment and/or the economical results. The cohesion of the local sheep industry is probably its best asset to confront the crisis they are experimenting nowadays.