

# FRENCH BEEF PRODUCTION: MEAT QUALITY, A CHALLENGE FOR FARMER PRACTICES

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## Abstract

despite the present difficulties in the beef meat sector, the most important points concerning production in France are still "what ?" (i.e. what kind of animals), "how many?" and "when?" and in a very few cases "how?". That is what is illustrated with different studies concerning relationships between market chain requirements and farmer practices for beef meat production in pastureland areas of France. The consequences on farmer practices of the involvement in quality market chains were analysed by comparing 15 of the most demanding "Label Rouge" specifications for beef meat production in France. The relationships between breeding practices and the orientation towards high quality meat production were then studied for 21 farmers in the Charolais area. As quality meat comes first of all from young females, the replacement and culling practices was analysed in 20 farms in the Limousin area in relation to farmers' commercial strategies.

The content of the different specification schedules points out the question of breed and animal categories, and less the "local" practices and the link to a specific production area. For the farmers, the degree of involvement in the quality market chains is firstly determined by the strategic policy of the commercial company to which they sell their animals. This degree of involvement can be measured in different ways: the number of quality signs involved, the number of animals sold in a year, the selling periods, but also the characteristics of the sales circuits (producer groups, supermarkets, independent butchers...). The technical implications for the farmers, as far as herd management is concerned, are not yet very restrictive. The elements identified as determining in the herd management are 1) the modalities, the criteria and the periods chosen for sorting animals (batching management practices), for females as for males, 2) the revision of replacement and culling policy in the reproductive herd, as well as the flexibility of the possible destination of commercialised animals.

## Introduction

As in other countries, the French beef meat sector is encountering several difficulties due to the different successive crises: bovine spongiform encephalopathy (1996, 2000) and foot and mouth disease (2001). As a response, the beef market chain operators have developed a number of quality signs. The challenge for all the market chains is to certify both the final product (i.e. the meat) and the farmers' practices. Four kinds of "quality signs" are official in France, as they are managed by associations recognised by the government: "Label rouge" (LR, 23 600 t in 2000), "Certification de Conformité Produit" (CCP, 69 000 t in 1999), "Appellation d'Origine Contrôlée" (AOC, 2 000 t), Organic Farming (AB, low quantity but increasing dramatically each year: + 50 000 cows concerned from 1998 to 1999, corresponding to a 40 % increase). The first two signs represent the great majority of the beef meat commercialised under official signs (> 95%), but only a small part of the total amount of the beef meat consumed (1 400 000 t). Three categories of animals are concerned by official signs in beef meat: finished heifers, steers and young cows (< 9 to 12 years according to the sign), the latter representing the majority of the market supplies (Roche *et al.*, 2000).

In France, there is a great diversity in the beef meat production systems, even if only specialised beef breeds (Charolais, Limousin, Salers, etc) are being considered. In 2000, 4 071 000 suckler cows were distributed among 161 000 farms. As for the proportion of meat produced by these suckler herds (vs dairy herds), according to the different categories of animals, it concerned 56% of all the meat produced: 30% for steers, 66% for bulls, 65% for heifers and 50% for cows. These categories, together with the meat produced by dairy herds, represented respectively 9, 21, 15 and 44% of all the beef meat produced in France (Geb, 2000). More than 1 000 000 weaned calves are exported, especially to Italy. Suckler herds are then divided in two main categories, which are those producing non finished animals (weaned calves) and those keeping animals after weaning to be fattened, with a large range of categories: 16 to 24 month-old bulls, 24 to 33 month-old heifers, 28 to 36 month-old steers, etc.

We assume that nowadays, despite the present difficulties in the sector (decrease in consumption and prices), the most important points concerning beef meat production in France are still "what ?" (i.e. what kind of animals), "how many?" and "when?" and in a very few cases "how?". That is what we will try to illustrate with different studies concerning relationships between market chain requirements and farmer practices for beef meat production in pastureland areas of France. These studies have been conducted for the last two years in the context of a program called "Adaptation of beef cattle production".

The questions we try to answer deal with the following points: 1) what are the consequences on farmer practices of the involvement in quality market chains? The results relative to this point were obtained by analysing and comparing 15 of the most demanding "Label Rouge" specifications for beef meat production in France; 2) what are the breeding practices associated with an orientation towards high quality meat production? We studied for 21 farmers in the Charolais area the relationships between the farmers and the buyers of their animals, especially producer groups, 3) As quality meat comes first of all from young females, we analysed the replacement and culling practices in 20 farms in the Limousin area in relation to farmers' commercial strategies.

## **1. Technical specifications to produce Label Rouge beef meat**

The LR is the only sign requiring a higher quality compared to a "standard" meat. So we began our investigations by analysing and comparing the 15 Label Rouge specifications for beef cattle agreed by the French government in 1999, assuming that they would result in the most restrictive elements for farmers (the question around "how ?"). First of all, the content of each schedule was compared to the technical notifications (TN) written by the Agricultural Government Office, which defines the minimum conditions to fulfil to obtain the Label Rouge sign (MAP 1998). To obtain the LR agreement, the different operators of the market chain have to create a specific group, named the "quality group". Then, they have to define their own specifications by respecting the TN requirements. These concern all periods, from the animal's birth to meat marketing in shops. Some implicit and explicit recommendations can be distinguished. The former concern current regulations, such as the banning of anabolic or animal meal products, and the latter are more restrictive and concern some compulsory procedures or minimum thresholds to respect that have to be clearly specified. The breeding type and the finishing mode must also be specified. Whatever the case, the potentially "labelled" animals are heifers over 28 months old, steers over 30 months old and cows less than 9 years old. The carcass must be classified E, U or R (EUROPA) and the fat score must be within three consecutive classes among 2, 3, 4 and 5.

The basis of the differentiation between each schedule of conditions deals with the breed and the breeding and finishing area. On this basis, four types of specifications were distinguished: i) national racial schedules (NR, n=4). One breed is specified without any requirement

concerning a specific breeding area in France, ii) racial schedules with a specific finishing area (RFA, n=3) the duration of which is at least 4 months. The area size is variable, from 1 to 11 French administrative divisions, iii) racial schedules with a common specific area (1 to 13 administrative divisions) for all the breeding period (RBA, n=4), from birth to finishing (to slaughtering in one case), iv) schedules with a specific area, but with several breeds allowed (BA, n=4). The area concerns finishing only in one case, the after weaning period in one case and the whole breeding and finishing period in two cases. In all cases, the area size is limited from 1 to 3 administrative divisions.

Some of the differences concerning technical specifications, either with the TN requirements, or between schedules, can be classified as "anecdotal" or "significant", according to their impact on farmer practices ("how?"). The former concern firstly general points of breeding (age at weaning, proportion of roughage in the diet), the latter the carcass characteristics and feeding modalities. Thus, the modalities of alternation between pasture and indoor periods are mentioned in 4 cases: respectively 6 or 9 months at least and 5 months maximum. In one case, there is a transhumance period of at least 4 months. Nitrogen products for feeding supplementation are forbidden in 3 cases, all are authorised in 4 cases, or authorised with restrictions in 3 cases. Maize is forbidden in one case whatever the presentation, is recommended in another case for the finishing (grain). In 5 cases, maize must not be the only food in the diet. In one case, it is forbidden for animals more than 18 months old. The finishing period modalities are described mostly in the RBA schedules. In one case, it must occur at pasture from May to August. In other cases, there is a closed list of allowed forages (n=1), some examples of diets are given (n=1) or silage is forbidden during the last 4 months (n=1).

We had statistical data concerning the size of the market chain for 6 schedules. They also differ in the number of farmers concerned: over 3500 in 2 NR cases, less than 250 in 2 other cases (BA and RBA), in the number of animals sold each year: less than 2 000 to more than 15 000. The number of animals concerned in one farm is very low, around 4 to 5. In one case, this number is 20. This concerns the smallest structure (RBA; 103 farmers; 2095 animals sold in 1997) whose products are essentially steers and finished heifers. This is the only case where a specific farming orientation is carried ("how?").

Finally the most important differences dealing with farming practices concern the breed ("what?") and the breeding area ("where?")! Some schedules are more restrictive but they are also the smallest ones, concerning very few animals. The main point which could question the herd management ("how?") would be the increase in the number of labelled animals by farm (so, rather "how many?"). It could require the management to be modified in order to produce either some steers (but this type of production is quite non-existent) or more young cows and heifers, which supposes a different replacement and culling strategy, as will be shown.

## **2. What kind of relationships between quality and the production system?**

We managed several surveys in different producer groups both in the Limousin and the Charolais areas, to learn about their point of view concerning the management of quality in beef meat and more especially the adaptation in their organisation to the evolution of the production context. As was shown in the previous part, the quality market chains differ in size, in age and in the animal categories sold. It is exactly the same situation for producer groups and some of them are engaged in only one quality sign when others prefer to diversify their activity. The example given in the previous part concerning the smallest structure (103 farmers and 2095 animals sold) corresponds to the former. This company created the first Label Rouge for beef cattle in France in 1974 and does not sell any other animal categories (except 2 or 3 cows a week produced by organic farming). Two other big companies,

commercialising around 60 000 animals/year (bovines) differ by their links to quality market chains. One is linked to only one slaughter house and manages two quality signs (LR and CCP) with a great number of animals concerned in each one (respectively 3500 and 4600). The other producer group has no contract with any slaughter house and animals are slaughtered in many structures. Moreover, 8 different quality signs are managed, concerning all the categories of animals. The aim is then to keep as much freedom as possible in the commercial activity rather than contracts, perceived as too constraining (combination of "when ?" and "how many ?"). Farmers have then to sign for as many contracts as quality signs managed by their producer group which carries out the sorting operations to direct animals into the different corresponding chains.

Concerning the question of "how ?", since July 2000, farmers who want to sell at least one animal under an official quality sign have to be certified. This means that the whole production system must match different specifications, instead of the animal only being the candidate to the quality sign, as it was the case before (i.e. the technical specifications dealt with individual animals more than the whole farm). The control system is just the same, as it is provided by the same companies, which are themselves under the control of the French government. This also means that a stockbreeder specialised in fattening, buying some animals outside, has to choose them in certified farms if he intends to sell them in quality market chains. Furthermore, farmers have to obtain as many certifications as quality signs they want to use (i.e. 3 certifications if they sell animals in 3 different CCP).

We tried to explore the different combinations in farms between technical aspects of herd management, i.e. breeding practices and the commercial aspects of the management (Ingrand et al. 2001). For example, it seems that there are two different strategies dealing with the farmer's point of view about quality market chains: either they adjust their system so as to maximize the number of animals sold in the quality meat sector (qualified as "quality managers"), or they have other priorities, such as simplifying their management due to a lack of workforce on the farm. We investigated the management and marketing practices for females and products in 21 Charolais farms specializing in beef production and selling animals in LR and CCP market chains.

**Table 1: Typology of 21 Charolais beef cattle farms based on the number of animals produced and sold in quality market chains (Label Rouge, and Certification de Conformité Produit).**

ACQ <sup>1</sup> /TAS <sup>2</sup>	AFQ <sup>3</sup> /ACQ	Farm number	TASQ <sup>4</sup> /AFQ	
Low (< 50%)	Low (< 35%)	2, 10	Null: 2	
			High (100%): 10	
	Mid (50-75%)	5, 6, 7, 11, 16, 21	Low (< 20%): 5	
			Mid (50-80%): 6, 7, 21	
			High (> 80%): 16, 11	
	High (> 75%)	4, 8, 13, 15, 18	Low (< 50%): 8, 15	
High (100%): 4, 13, 18				
High (> 50%)	Mid (50-75%)	3	High (81%)	
	High (>75%)	1, 9, 12, 14, 17, 19, 20	Low (< 20%): 12	
			High (> 80%): tous sauf 12	

<sup>1</sup>Animals "candidates to quality market chains" = steers, heifers and cows

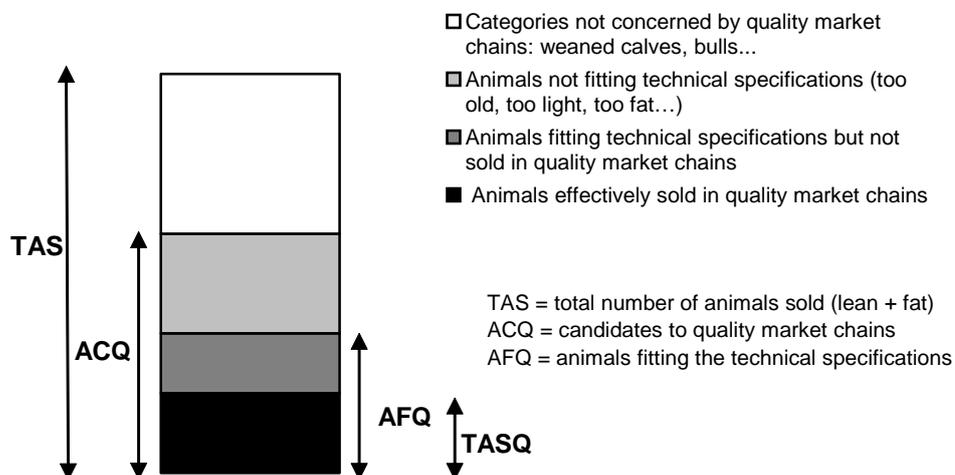
<sup>2</sup>Total number of animals sold in 1999

<sup>3</sup>Animals fitting the technical specifications

<sup>4</sup>Animals effectively sold in quality market chains (steers, heifers and cows)

We analysed the results after calculating for each farm the following variables (figure 1): i) the number of animal "candidates" for quality market chain (ACQ), i.e. heifers, young cows and steers, ii) the number of animals fitting the CCP technical specifications of quality market chains (AFQ) among the previous categories, iii) the total number of animals sold in a year whatever the category (TAS) and the number of animals effectively sold in official quality market chains (TASQ). Then high values of the ratio  $ACQ/TAS$  reveal the orientation of the production system towards fattened animals staying a long time on the farm. The value of the ratio  $AFQ/ACQ$  is correlated to the ability of farmers to manage animals to fit technical specifications and the value of the ratio  $TASQ/TAS$  is a measurement of the commercial strategy of the farmer. We classified farmers with the ratio  $AFQ/ACQ$  over 75% ( $n=12$ ) as "quality managers" (table 1).

**Figure 1: Proportion of the total number of animals sold in farms according to categories corresponding to their degree of conformity to technical specifications for quality market chains.**



The main result derived from the study is that the farmers most involved in the quality meat sector (quality managers) do not necessarily adopt specific management practices, in particular more meticulous, more individual-focused management than others. The number of animals fattened is determined more firstly by the place available in the barn and the whole system is adapted for a constant number of heifers and/or steers fattened each year. There is also no difference concerning the selling period, especially for the more favourable period, in spring. The average age of cows, in particular the proportion in the herd of cows more than 10 years old (ranged from 1 to 18%) is lower in herds of farmers most involved. These farmers delegate far more extensively the marketing function to the producer groups, even though this may involve lower valorisation of each individual animal. A great diversity in the management of culled cows (selling period, feeding) is observed (figure 2) but this is a within-farm diversity rather than different strategies discriminating farmers, showing that the challenge for the farmers is then not only "what?" but also "when?".

Based on these results we propose and discuss a new classification of farmers combining their practices and their involvement in the quality meat sector.

**"100% quality market chain"** (5 farms). All the production system is organised to sell animals in official quality sign market chains. There are more specifically oriented toward "Label Rouge" production and the quasi totality of their potentially labelled animals are effectively labelled. Their main motivation is to respect traditions (grass feeding,

slaughtering in the same area as breeding) and to valorised both females (cows and heifers) and steers, which constitutes significant production in these farms.

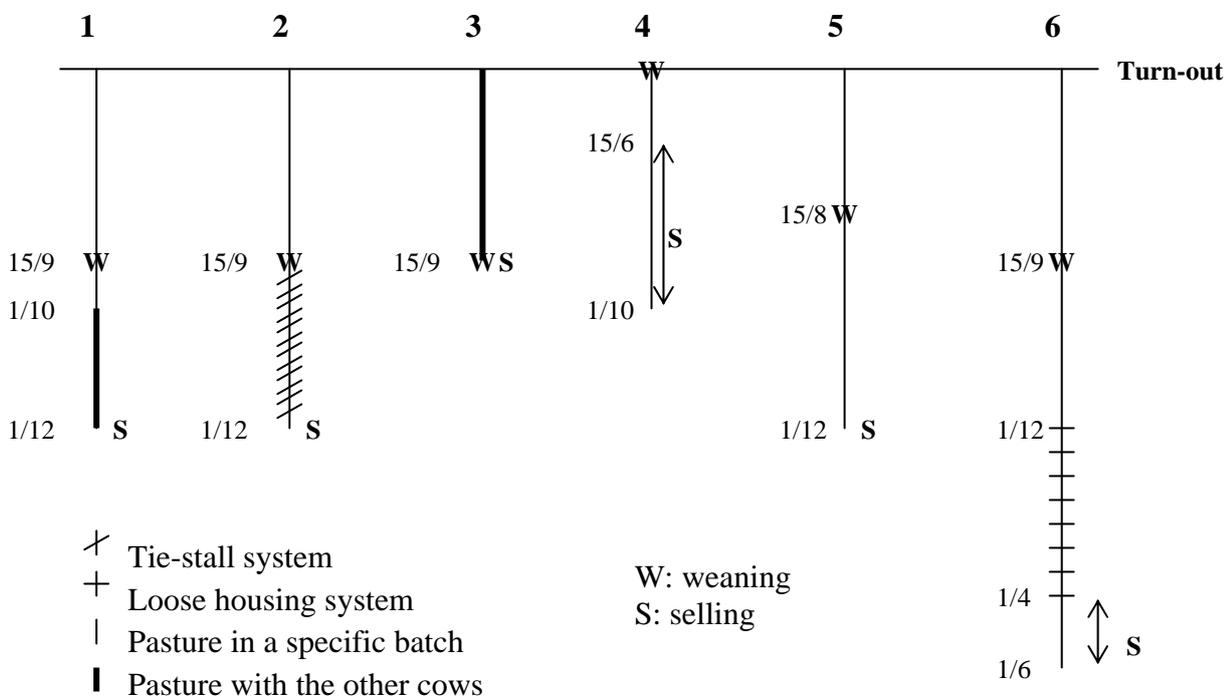
**"Female-oriented quality "** (4 farms). These are farmers highly involved in quality market chains, but specifically for females. All males are sold at an early age (weaned calves or fattened bulls).

**"Active opportunists"** (2 farms). This concerns farmers proposing for sale only animals with an excellent conformation. This concerns few animals, but when prices are at their highest. Each animal is a "special case" and ones that are only average are not considered economically interesting enough to be fattened. The first motivation to sell in a quality chain is the margin, far beyond the brand image.

**"Passive opportunists"** (5 farms). These farmers have low interest in quality market chains and do not perceive the potential gain they could obtain. Generally, they do not know the content of technical specifications. It is the producer groups who give them the opportunity to sell some animals when there is a lack of production or for an exceptional animal. Their production system is generally based on a great diversity of animals produced, combining short and long cycles (i.e. 30 to 36 month-old heifers, 3 year-old steers in 2 cases).

**"Critics"** (5 farms). These are farmers rather dissatisfied with quality market chains, who consider that the increase in value is not fairly distributed (they consider that the goal is to maximise the quality/price ratio rather than quality alone). Furthermore, they disagree with the necessity of "total supply" of animals when contracting with a producer group. For them, "what is important is to produce high quality carcasses and to obtain a high price, not to sell them in a specific market chain". Thus, they are able to produce many animals matching the technical specifications but very few are sold in official chains. Most of them are sold in short circuits (butchers) being very well valorised.

**Figure 2: 6 different management modalities for culled cows selected at turn-out to grass**

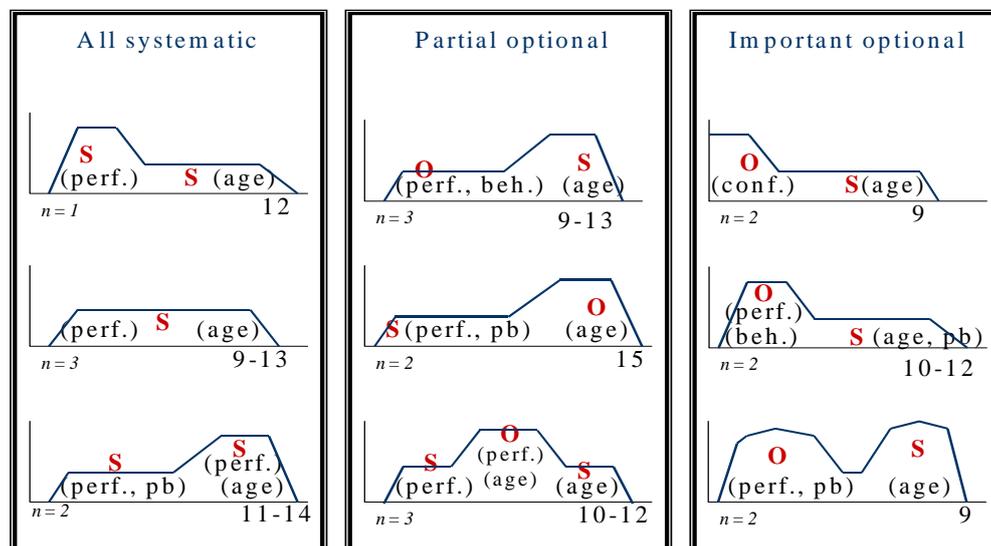


### 3. Quality means young females: replacement and culling strategies

Cows less than 9 years' old, having calved at least once, represent the great majority of the beef meat sold under quality signs. So, many commercial structures tend to increase the

number of young cows slaughtered, matching the quality market chain specifications with active political actions and financial subsidies. It is the case for example in the Limousin area where these subsidies are given to farmers having a replacement rate of over 18%. The commercial structures consider that the replacement rate is the critical point to increase the opportunity to sell animals in the quality market chains. Our purpose is then to understand what kind of replacement decisions and/or practices are linked with the replacement rate level. So we analysed the relationships between the replacement rate and the replacement and culling practices (Roche et al. 2001). It was assumed that the differences in replacement rate concern other heifer sorting practices and different culling practices (criteria, sorting period, batching strategy). Surveys were carried out in 20 farms in collaboration with 3 producer groups, with a wide range of replacement rate: 15 to 39% (calculated by the proportion of first calving in the herd). These values are greater than those observed generally in Limousin farms: 15 to 18% on average (Cotiniaux 1997). All farmers were engaged in quality signs and were in a stable-state period according to the herd size. The information collected deals with periods and number of animals concerned by batching operations (heifers and culled cows), the diet for each batch, the sorting criteria of heifers and for each culled cow: the selling, drying and calving date, the destination of the calf and the culling criteria. To analyse the culling strategies, 3 concepts were used: i) the culling cause, i.e. the reason evoked by the farmer (e.g. cow's age), ii) the culling type, grouping the culling causes into 3 categories according to the farmer's point of view: involuntary, voluntary-systematic, voluntary-optional, iii) the culling mode, representing the culling causes and types according to the age of the cows, and thus the target age-class for systematic and optional culling.

**Figure 3: Number (vertical axis), causes and types (S=systematic, O=optional) of culling according to the age of cows (horizontal axis)**



### 3.1. Culling cows

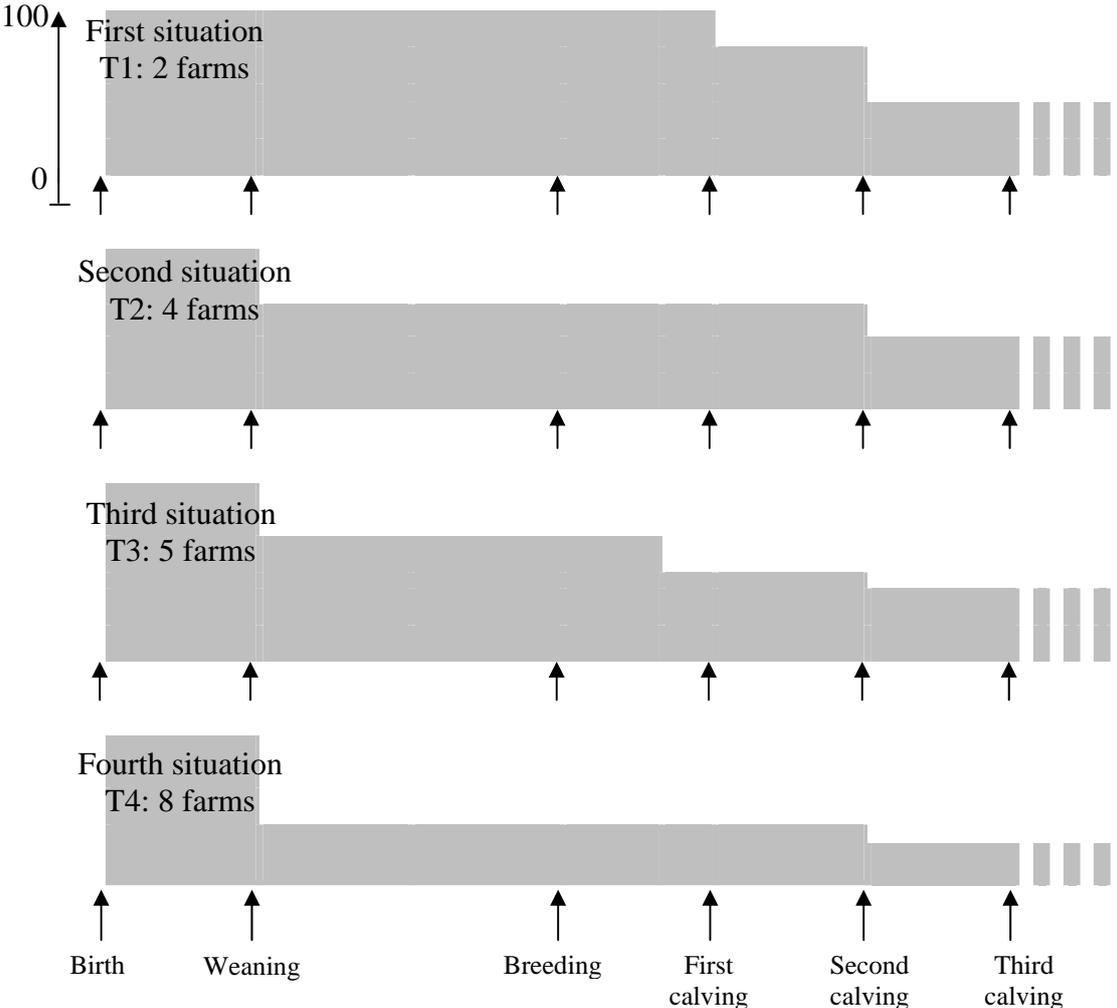
According to the farmers, 6 culling causes can be identified: age, behaviour, conformation, low performance (milk yield and/or daily gain of the calf), sanitary problem or calf death at calving or a few days later. On this basis, 3 different culling profiles can be described. The first one corresponds to a "regular" distribution of 4 main causes: age, low performances, no calf and behaviour. The second one concerns the situations where sanitary aspects take a significant place and the last one is characterised by resorting to the conformation criterion.

The involuntary, voluntary-systematic and voluntary-optional culling types represent respectively 9, 62 and 29% of the total culled cows. The proportion of optional culling varies greatly between farms, from 7 to 53% and is closely linked to the replacement rate, indicating the greater opportunity to choose "freely" the animals to be sold when the number of heifers available is sufficient. The average values for optional culling are 11, 23 and 42%, respectively when replacement rates range from 15 to 18, 19 to 22 and 23 to 39%.

The different combinations of culling modes are represented and summarised in figure 3. A first group (A) concerns 6 farmers using mostly systematic culling. According to the position of the culling "peak" (age-class target), 3 sub-groups (A1 to A3) can be distinguished. For the second group (B1 to B3) the farmers use a significant part of optional culling. The 3 sub-groups differ for the shape of the curve (number of peaks), the age class concerned for optional culling and the corresponding culling causes. The B1 and B2 modes are characterised by a peak for old cows, the B3 mode by an "optional peak" in intermediate ages. The third mode (C) concerns farmers culling a great number of young animals (3 to 5 years old) most of the time associated with a voluntary-optional type, combining different criteria and different age-class targets (C1 to C3).

**Figure 4: Replacement strategy: four kinds of heifer trajectories (T1 to T4) from birth to third calving.**

The horizontal axis represents time and the vertical axis represents the proportion (% of total females born) of females staying on the farm from birth to the third calving.



### 3.2. Recruiting heifers

Heifers can be selected at three main periods: at weaning, between 1 and 2 years old and between first breeding and first calving. These situations can be combined in the same farm, can be more or less severe and can induce the creation of specific batches. Then, different trajectories (T1 to T4) of heifers can be drawn (figure 4). T1 corresponds to an absence of selection before first calving: all the heifers are mated and stay in the farm until their first calving. T2 corresponds to a first selection at weaning and then only after the second calving. T3 corresponds to a first selection at weaning, a second one at 28 months, no selection at first calving and the beginning of culling after the second calving.

### 3.3. Synthesis: interaction culling x replacement

Three types of combinations between culling and replacement strategies were identified and analysed in relation to the replacement rate.

Type 1: culling practices associate age as a systematic criteria for old cows (threshold of 12 years) and optional criteria for young cows (C mode in figure 3). In all cases, there is a peak of culling for those young cows. Either there is at least one calving for all heifers born in the farm (n=2) and then the replacement rate is high (37 and 39%), or almost half of the heifers stay until the second calving to be selected (n=4, the first selection occurs at weaning), with replacement rates between 20 and 30%.

Type 2: no use of optional culling, corresponding to the A mode for culling (figure 3) and to the trajectory T3 of heifers (figure 4). Compared to the type 1, culling and recruiting concern distinct categories of animals, according to their age (5 to 14 years for culling, 8 to 10 months for recruiting). The replacement rates are the lower in the sample and range from 15 to 21%.

Type 3: intermediate case between types 1 and 2 with two different situations: i) the number of culled cows is determined as a result of the number of heifers early selected (at weaning). The number of heifers is sufficient to allow some optional culling among mid-ranged age cows, ii) the number of selected heifers is determined by the number of culled cows which are chosen among the oldest cows of the herd (from 12 to 15 years old). The replacement rate in this type are very widely ranged, from 15 to 27%.

## Conclusion and perspectives

When the different successive crises occurred in recent years, the share of beef meat concerned by official quality signs was the only one not affected, even tending to increase. So, it seems to be a good response to the consumer's suspicion which concerns more and more the way animals are managed, and therefore the question of "how?" evoked in the introduction. The content of the different specification schedules points out the question of breed and animal categories, and less the "local" practices and the link to a specific production area, such as for wine for example. This last aspect should change if some localised beef meat productions obtain the "Appellation d'Origine Contrôlée" (AOC) which correspond to a sign specifically based on those considerations.

For the farmers, the degree of involvement in the quality market chains is firstly determined by the strategic policy of the commercial company to which they sell their animals. This degree of involvement can be measured in different ways: the number of quality signs involved, the number of animals sold in a year, the selling periods, but also the characteristics of the sales circuits (producer groups, supermarkets, independent butchers...). Moreover, the technical implications for the farmers, as far as herd management is concerned, are not yet very restrictive. The challenge for the farmers appears to be in their ability to manage the individual diversity of animals in the herd, with different possible strategies concerning the

type of animal produced: heifers, young cows, sometime steers or the combination of these categories. Then, the elements identified as determining in the herd management are 1) the modalities, the criteria and the periods chosen for sorting animals (batching management practices), for females as for males, 2) the revision of replacement and culling policy in the reproductive herd, as well as the flexibility of the possible destination of commercialised animals.

From an economic point of view, two facts should be underlined: i) there is no direct cost (i.e. no fees) for farmers when joining Label Rouge or other certification procedures, ii) commercial benefits range from 0.1 to 0.3 Euros per kg carcass, according to the market chain and to the period, for animals sold in quality market chains. The most important constraints as expressed by farmers themselves concern the necessity to ensure traceability for any sanitary treatment and the growing weight of paper work : they feel more like paper managers than like animal managers...

To conclude, we believe that the challenge and aim of any certification procedure should be oriented and then built to primarily meet rural area stakes (i.e. for local development) rather than being developed at the farm level only, as this allows the recognition of specific local resources, e.g. breed, knowledge, practices... It follows that quality signs do not all have similar impacts. It is our opinion that local signs, which are based on a local breed and/or require animals to be born, managed and slaughtered in the same small geographic area, may contribute to improve rural livelihoods, whereas national-scale quality signs may be considered more as a way to absorb the crisis in agriculture/livestock farming.

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