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Integrating extensive beef productions into the agro-food chain

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Abstract. Agricultural outputs are immersed in a context of change characterized by an evolution from the quantity to the quality, in consonance with consumer's demand. Among the different productions, beef has been one of the more affected goods, due to the confluence of different factors, such as: the high international competition, the existing surpluses in the European Union, food crisis, as EEB, and more recently, those aspects related to animal welfare and the environment. Integrating quality beef into the food chain, and particularly, the one coming from extensive breeding systems, evidence different aspects insufficiently well-known, both, from the point of view of the production as from the demand. This article, try to identify such factors in order to get a better integration of this kind of productions into the food chain, by applying Delphi Methodology, in order to summarize and present the information given by different actors, as farmers, consumers, policy makers, administrative institutions...Results, evidence a high consensus about the need to keep on working in the differentiation of the product as well as to improve the information and promotion of this product, being production costs or even the price, not so decisive in this case.

Keywords: Quality beef, extensive production systems, Delphi analysis.

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1. Introduction to the State of the Art: Background.

The recent incorporation of the concept of multi-functionality into the new model for European agriculture implies the setting up of a fundamental linkage between sustainable agriculture and several other factors. These include the quality and the healthy properties of foodstuffs, balanced land use, the conservation of landscapes and the environment, and food safety [1] [2]. This concept, incorporating the non-productive functions of agriculture, legitimizes public support for the new commitments taken on by farmers in respect of consumers who require both food and public utility. In fact, for some time now a range of studies have been highlighting the dissatisfaction among European citizens with regard to intensive practices in agriculture, together with majority support for the new objectives of the Common Agricultural Policy (CAP) previously mentioned [3].

Cattle farming, which is of considerable importance in European rural areas, is currently facing problems of a lack of balance between production and consumer requirements. It is simultaneously frustrating many hopes and aspirations on the part of other producing countries, all of which points to problematic times to come.

For a considerable time the long-established intervention mechanisms have been generating very large surpluses of meat. At the same time, meat prices within the European Union have been much higher than would be the case in a free world market [4].

A number of procedures have striven to find a solution for the problems described above, advocating less intensive production methods. However, the results achieved have not always been in accordance with the objectives sought. Thus, the reform of the CAP in 1992 made a first attempt at improving the situation by a reduction in price subsidies, compensating farmers for their drop in earnings by direct income support and bringing in measures to stimulate less intensive practices. Later, Agenda 2000 took these aspects further. Hence, the reform of the organization of the beef and veal market approved by Council Regulation EC 1254/1999, which established the new Common Market Organization (CMO), has among its aims the provision of incentives to producers so as to avoid excessively intensive forms of production.

However, although the mechanisms for managing the market approved in Agenda 2000 would seem to have been sufficiently solid and flexible to facilitate a recovery in the beef and veal market, and although

less intensive production has gained ground, thanks to a redefinition of the premium for lower-density practices, over time it has become plain that the tools in the CMO have not been able to discourage intensive production as much as had been hoped. The facts that payments are per head, that stocking density is based on the premium applied for and not necessarily on the actual number of cattle, together with the exemption from stocking density requirements in the case of "small producers", defined as having a maximum of 15 livestock units (LUs), are among the factors favouring the persistence of intensification in production. Thus, the Commission proposes to eliminate payments per head, replacing them with a single income support payment per farm, based on existing rights, together with stricter conditionality requirements. This should reduce the pressures leading to intensive production practices and should contribute to balancing the market ^[5].

In this same context, it is considered essential for any incentives received by farmers to be linked in some way to objectives relating to the environment, to animal welfare, and to the safety and quality of foods. The introduction of measures of this type into normal production practices involves increased costs and a loss of efficiency among farmers in the European Union as against their counterparts in other countries. This must be limited in some fashion, which means that direct payments continue to be essential.

At the same time, there is complete consensus about the fact that agriculture should make its products match demand and incorporate food safety and quality as a priority objective in the CAP. It is likewise recognized there is a need to provide greater support to traditional farms, so as to take advantage of the opportunity offered by the preference of consumers for premium quality products. The proposal is to include animal welfare and food safety completely within the CAP, through an obligation to fulfil a series of criteria relating to the environment, food quality and safety, and animal welfare, in order to receive direct aid, payments being proportionally reduced in the case of non-observation, as a function of the risk arising. In this way an attempt is being made to bolster fulfilment of the standards covering these aspects [5]

Finally, in June 2003 the new reform of the CAP approved the single payment scheme (SPS), a system of annual grants paid to producers which are not linked to production ("decoupled"), this constituting the principal feature of the reformed CAP. The SPS combines various direct payments currently given to farmers into a single payment, calculated on the basis of amounts received during a given reference period ^[6].

Nonetheless, member states may opt for the introduction of the SPS in full, combining all grants into a single payment, or they may decide to keep some part of the direct aid given to farmers in its current form ("partial decoupling"), if they consider that a move to the SPS would lead to disruptions in agricultural markets or to the abandonment of production. Thus, in the case of Spain, although the decision was taken to decouple completely certain support payments, such as the premium on bulls and steers, others were retained with total or partial linkage (premium for suckling cows, slaughter premium). While it is to be expected that total decoupling will lead to a decrease in intensive farming, the retention of linked premiums might have the effect of making some production more intensive [7].

In any case, in disadvantaged and mountain areas extensive cattle farming is, in practice, one of the few possible agricultural activities. In these zones it plays a crucial part in nature conservation ^[8]. Hence, in the new scenario for liberalization, it was to be expected that a system of direct grants would be established to remunerate the provision of public utility. However, it is not advisable for cattle production to become merely a subsidized sector. The market, satisfying a demand for quality on the part of consumers, should allow farmers to carry on an economically viable activity that would round out these direct aid payments. Thus, provision should be made for the products from these zones to be put on the market under circumstances of economic viability ^[9].

In Spain there are still some areas where traditional systems of animal husbandry persist, as is the case in the disadvantaged and mountainous zones in the Autonomous Community of Castile and Leon, where low-density cattle farming is in practice one of the very few agricultural activities feasible. In fact, the impressive variety of species (both botanical and zoological) found there is, to a great extent, the outcome of the retention of a pattern of very limited fertilization combined with the regular removal of living biomass through reaping or grazing [10]. Nowadays the intention is to preserve this great richness, with an eye to ensuring the survival of many threatened species, areas and resources. Hence, international agreements on biodiversity are being signed, initiatives for nature conservation are being encouraged, efforts are being made to combat desertification, and plans for reforestation are being promoted. In short,

an attempt is being made to give some substance to the proposals for development and the environment, for quality of life and demographic stability or for the sustainable use of resources [11].

The importance of using the land by means of low-density cattle farming systems is evident. However, the successful placing on the market of cattle products, particularly meat to be eaten fresh, involves numerous facets. These concern both production and demand, about neither of which there sufficient information.

Thus, apart from technical considerations of a general nature relating to low-density production systems for beef and veal, there are some empirical studies at a local level that point to the scant economic viability of this sort of production under the conditions affecting it at the present day ^[12]. It is therefore essential to introduce changes that will alter the system itself, the size of farms, and, above all, the organization of farmers and their participation in the food production chain.

Moreover, the market for meat is extremely competitive, being dominated by more intensive species offering cost and price advantages ^[13]. In this context, meat from ruminants (sheep and cattle) had hitherto retained an image of higher quality. This has lost credibility with consumers in recent years, among other reasons because of the practice of intensive fattening used by producers, who have made use of growth promoters and hormones, and recent episodes of disease and food poisoning that have lessened trust of the sector and brought about decreases in consumption ^[14].

Finally, the limited elasticity of demand for food products with respect to price and the higher levels of income in developed countries have led to prices losing their predominance in the demand function. They have been supplanted by other attributes such as food safety, quality of flavour and aroma, and the use of production systems that respect the environment or animal welfare [15]. Under these circumstances, differentiation of the product emerges as an appropriate strategy to ensure the survival of the sector, especially as regards fresh meat, a market dominated by large production and distribution units.

2. Objectives

In the light of what was explained above, in order for meat produced in non-intensive ways to be an effective element in rural development and in enhancing the value of farming activities, it is necessary to consider the problems of bringing it into distribution circuits. This would involve an attempt not just to shorten commercial logistic routes, but also to encourage collaboration between producers and distributors, in such a way that the quality demanded by consumers would be ensured by all the enterprises taking part.

Thus, the present study concentrated on the geographical area Castile and Leon, which, as mentioned above, is one of the regions of Spain where traditional non-intensive farming systems still survive. It was by way of an exploratory project, which attempted to identify which were the aspects that might encourage or discourage participation in production activities by the various economic agents who intervene in making the product available (farmers, processers and distributors). It also endeavoured to evaluate how appropriate it would be to implement a range of different strategies that might improve the access of meat produced on non-intensive farms to commercial distribution channels, and in particular to determine which features might help to differentiate this product in the marketplace, thus increasing the supply of such meat by satisfying the requirements of current-day consumers. In this way, the study is intended to constitute a source of information allowing action plans and future strategies to be drawn up.

3. Methods

In this project, the research technique applied was the "Delphi Method", an approach which is particularly useful when the intention is to find a consensus about given trends on the basis of the informed opinions of people whose joint knowledge and experience cover the widest and most diverse field possible. That is to say that an attempt is made to learn various different viewpoints, but not just any views, rather those which are sufficiently well informed, laying stress not on diversity, but on a search for common ground.

The Delphi Method, whose name comes from the ancient Delphic Oracle, has its origins in the early 1950s in the context of Project RAND and its offspring the RAND Corporation. It was devised by Olaf Helmer and Theodore J. Gordon, as a tool for predicting events in the case of inter-continental conflict or a possible nuclear war. Since then it has been frequently used as a system for obtaining information about the future.

• The Delphi Method is classed as a system based on experts. That is to say, it falls among those methods grounded in consultations of people with a considerable knowledge of the context in which an organization operates. These people lay out their ideas and finally a report is drawn up to record what, in their opinion, are the possible alternatives that will arise in the future.

Briefly, the steps taken in order to guarantee the quality of the results were the following:

Stage 1: Formulating the Problem.

This is a highly crucial stage. The importance of defining the field of investigation with precision is considerable, since it is essential to be very sure that the experts forming the panel have the same notion of the field in question.

Stage 2: Choosing the Experts.

This stage is vital in so far as the definition of an "expert" is vague. Different authors stress the need for experts to be chosen on the basis of their knowledge of the topic upon which they are to be consulted [16].

Although there is no way to set rigid limits to the optimum number of experts participating in a Delphi survey, studies carried out by Rand Corporation researchers [17] indicate that a minimum of seven experts would seem to be needed, as error decreases in noteworthy fashion for every expert added up to a total of seven. However, it would not appear to be advisable to call on more than 30 experts, since above that number any improvement in predictions is very small and normally the increases in costs and research effort would not be commensurate with any resulting small enhancements in accuracy.

In this instance, the decision was taken to select a panel made up of a total of 28 experts: four belonging to the Regional Government, four to Research Bodies (CSIC [the Spanish Council for Scientific Research] and universities), seven to farmers' associations, five to certifying bodies and eight to the processing and distribution sector.

Stage 3. Data Collection.

The questionnaires were drawn up with an eye to facilitating responses from those consulted to the fullest degree permitted by a research project of these characteristics. The questions were closed-ended or partly closed-ended, involving Yes/No responses or answers on a five-point scale, the scales being categorized as 1 (Not necessary) to 5 (Totally necessary); 1 (Of no importance) to 5 (Very important); or 1 (Completely disagree) to 5 (Fully agree).

In the theoretical formulation of the Delphi Method, the aim of having successive questionnaires is to decrease the dispersion of opinions and refine the average opinion among those consulted. Hence, it was decided to carry out two rounds or iterations, so as to circulate the information acquired among all those who had collaborated by contributing their knowledge and opinions to the study and to consolidate and back up the results obtained in the initial consultation.

The first circulation of a questionnaire was carried out at the end of 2007 and followed by statistical analysis (calculation of averages for the central trend and dispersion). The second circulation was undertaken at the end of February and beginning of March of 2008, after which there was a final statistical analysis and interpretation of results was performed.

Stage 4. Data Analysis.

Thanks to the implementation of these two rounds, a basic statistic analysis was facilitated. This allowed the average consensus opinion and the degree of deviation of opinions to be established.

Stage 5. Results and Conclusions.

Once the data had been analysed, results were obtained and conclusions were drawn, these being presented in the next two sections.

4. Results

The sections below set out the results obtained from integration and statistical analysis of the information emerging from the application of the Delphi Method. The results are shown grouped under a number of headings. First, the variables that can act as possible incentives or disincentives to participation in the

system of production by the various components of the food-supply chain (producers, distributors y processers) were identified and evaluated. Secondly, those variables that are likely to have most impact on the incorporation of meat coming from non-intensive systems into commercial distribution channels were pinpointed and assessed, with special reference to the characteristics of the product and to strategies for differentiation.

4.1 Variables Acting as Incentives for the Various Players in the Food Production and Supply Chain

For them to undertake an enterprise initiative, those in the producing sector (farmers) must be able to perceive some financial advantage and some viability for production. This fact is made plain by various studies ^[9], as well as being re-affirmed by the opinion of the experts consulted. They stated, with a high degree of consensus (standard deviation 0.6), that the factor most likely to encourage participation of the producing sector in the production and certification of non-intensively farmed beef and veal is the possibility of getting a price surcharge (4.6 on the five-point scale running from 1 = Of no importance) to 5 = Very important). Other factors that might stimulate participation by producers are also of a financial nature (aid under the CAP)¹ and features relating to the perception of products by consumers (healthy and high-quality product). This is in agreement with the trends noted in a number of studies into the preferences and concerns of consumers ^[14]. In contrast, they do not hold the opinion that self-esteem of farmers themselves as economic players producing goods that are paid for adequately in free markets without need for subsidies is nowadays an incentive of any weight for the producing sector. It likewise appears, as the experts see it, that possible concerns of consumers for the environment or animal welfare do not play any serious part as an incentive for this sector, either (Figure 1), this contrasting with the demand from consumers for production systems that are sustainable and respect animal welfare that has been noted in several studies ^[18] [19] [20].

On the opposite tack, the factors that most discourage farmers from participating in the production of non-intensively farmed meat are the greater cost of production and the lack of differentiation of the product and of consumer information, combined with the resulting limited development of commercial distribution channels for such products. These higher costs on the one hand have an impact on the poor viability of such products, already recorded in several studies ^[12], and on the other, together with the limited development of commercial distribution channels, additionally increase the difficulty of competing with other, more viable, types of production, such as intensive farming systems ^[13]. Finally, the experts do not consider that aspects related with the health or the reproduction of livestock herds have any great weight in farmers' decisions. The weightings assigned to other factors may be noted in Figure 2

The non-intensive production of beef and veal evidently also requires the participation of other parts of the commercial food-supply chain. Hence, it would be impossible to encourage the producing sector without simultaneous encouragement to the processing and distributing sectors.

As the experts see it, the incentives for the processing and distribution sectors are very similar to those for the producing sector. First comes any possible premium on price and commercial factors (opportunities to get into new markets or to be the exclusive commercial distributor for a brand), together with factors relating to the concerns and preferences of consumers (quality and health). For distributors, no weight appears to be attached to any possible consumer concerns for animal welfare or the environment, nor to the possibility of improving the socio-economic situation in rural zones (Figure 3).

As occurs with farmers, at the head of the list of disincentives come financial and commercial factors (insufficient demand and higher costs), together with the poor differentiation of the product and lack of consumer information. The degree to which there are farmers' associations does not appear to be an obstacle to bringing this sector into the commercial supply chain, as is also the case in respect of international competition or that from other regions (Figure 4).

4.2. Bringing Non-Intensively Farmed Beef and Veal into Commercial Distribution Channels.

¹ This reflects the soundness of introducing a range of policies already noted above, such as conditionality ^[5] and the coupling of certain types of aid ^[7].

6

4.2.1. Identification and Evaluation of Possible Strategies to Enhance the Presence of Non-Intensively Farmed Meat in Commercial Distribution Channels

With respect to the strategies to be implemented in the sector so as to enhance the presence of nonintensively farmed meat in commercial distribution channels, the experts hold the view, with a considerable degree of consensus, that it is most necessary to continue working on the differentiation of the product and on improving consumer information and promotion. They feel that decreasing prices for consumers, or even reducing production costs, are not so vital in this case. Other strategies, such as improving the distribution of the product and the outlays involved in this, along with continued efforts to improve quality, breeds and monitoring and certification of the product, are likewise considered important, although there is less agreement about them (a larger standard deviation in responses) among the experts consulted (Figure 5).

4.2.2. Characteristics of the Product

In the opinion of the experts consulted, the most crucial factors in determining the quality of the product are flavour (4.5 on a five-point scale running from 1 = Of no importance to 5 = Very important) and the type of feeds and fodder provided, followed by handling after slaughter, and presentation at the point of sale. Of the remaining factors, age at slaughter, system of rearing, degree of fattening and several others had a lesser, but still considerable, weight in determining the quality of the product. The breed of animal and its origin were those that appeared to be of the least importance (3.5 on this same five-point scale). These also showed the greatest dispersion of responses, although it should be stressed that even in respect of these factors there was a high level of agreement as to their weighting (Figure 6).

4.2.3. Strategies for Differentiation

With regard to product differentiation (Figure 7), seen by the experts consulted as a very necessary strategy for bringing non-intensively produced meat into commercial distribution channels, the panel felt that this differentiation should be based on an indication of origin, feeding and a sustainable system of production that respects the environment. All of these are characteristics that set apart non-intensive systems of animal production. Additionally there was a high level of consensus on the topic of guaranteeing all this with a brand-name. The breed of animals and reference to respect for animal welfare tended to be seen as important, though to a lesser extent than the remaining factors.

If the relatively low status assigned to some of these factors (especially those relating to rearing and feeding systems) by consumers [21] is kept in mind, it will be seen that there is a major obstacle to differentiation of meat derived from non-intensive systems, as against others. Hence, express reference on the label to those factors linked to the monitoring in force, so that consumers can distinguish between the various types of meat covered by a certification procedure, together with an appropriate policy for promoting the product, such as to inform consumers and give new prominence to the advantages of non-intensively farmed products, would be a strategy worth considering. It would of course also be very worthwhile to guarantee the product through the existence of a brand name, since consumers indicate positive attitudes in this respect [21].

5. Conclusions

- 1. As might have been expected, financial viability, achieved either through a higher price for the product or through direct aid, compensating for the higher costs of production, turns out to be the key variable in determining participation by the various players in the food-supply chain (producers, processers and distributors) in production activities.
- 2. Of equal importance is the part played by factors related to consumer concerns with aspects such as quality and health. These act as incentives encouraging participation by the sector in the food-supply chain.
- 3. The sector is aware that the lack of adequate differentiation of its products does not allow consumers to appreciate fully the advantages that meat produced under non-intensive conditions might offer in this area. This leads the factor, along with financial considerations, to be the principal disincentive to participation by the various players in the sector.
- 4. In consequence, joint effort is required to achieve adequate differentiation of the product. Attaining this goal is directly linked to the use of mechanisms for transmitting information to

- consumers and promoting the product. This supports the need to carry out further studies in this field.
- 5. It is likewise necessary to continue to work on those aspects relating to the quality of the product, especially those linked, whether directly or indirectly, with intrinsic features like flavour. However, presentation at the point of sale is considered equally crucial for achieving differentiation of the product.
- 6. The enhancing, in the eyes of consumers, of the importance of aspects such as breed, and the systems for feeding and rearing by means of information and promotion campaigns, that will make them aware of the relationship between the aspects mentioned and the final quality of the product, is equally necessary. For this purpose, co-ordination and co-operation between public bodies and the economic agents involved might result in a favourable promotion of this economic activity.
- 7. In any case, the results obtained point to a need to use specifically those variables characteristic of non-intensive farming systems, such as links to local areas (origin), animal welfare and the sustainable nature of this sort of production, as features differentiating the product. All of this must, of course, be accompanied by the presence of a recognized brand that guarantees the quality of the product, this being a key tool in product differentiation.
- 8. Similarly, it is also of importance to inform and make aware those working in this sector of the weight laid on the factors listed above and the part they may play in affecting the consumption of meat. This is so as to make them into possible incentives encouraging participation in production activities, as for the moment they do not appear to act in this way.
- 9. Constant effort on all the aspects mentioned above will allow differentiation of the product to be achieved and will justify to consumers the payment of a slightly higher price, always assuming the product offers the characteristics expected. It is of particular importance how it is presented in the establishment where it is finally purchased.

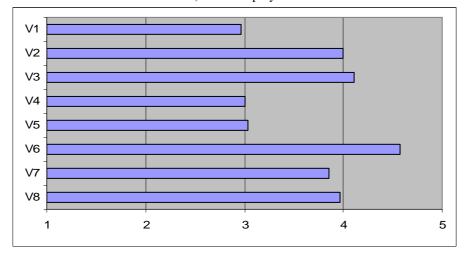
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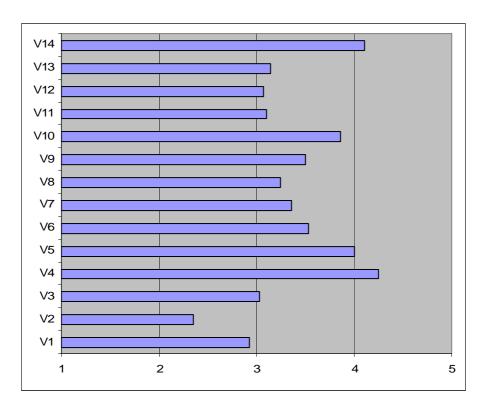
7. Figures

Figure 1. Incentives for Farmers to Participate in Non-Intensive Production of Beef and Veal (Delphi Method). Drawn up by author.



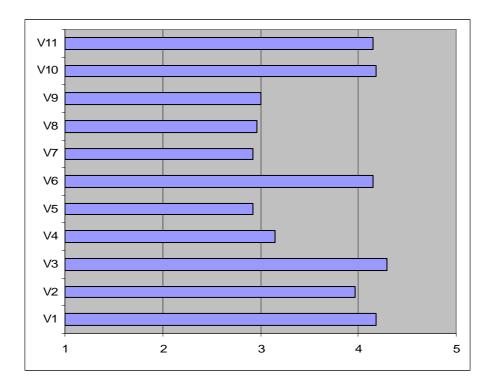
Code	Concept	Code	Concept
V1	Self-esteem of farmers as economic agents with a social and	V5	Social concerns about the
	environmental function		environment
V2	Grants and subsidies from the CAP	V6	Possibility of obtaining a price
			surcharge
V3	Product image as healthy and of high quality	V7	Perception of the product by
			consumers
V4	Consumer concerns over animal welfare	V8	Consumer worries over food
			safety

Figure 2. Factors Discouraging Farmers from Participation Participate in Non-Intensive Systems for Rearing Beef and Veal Cattle. (Delphi Method). Drawn up by author.



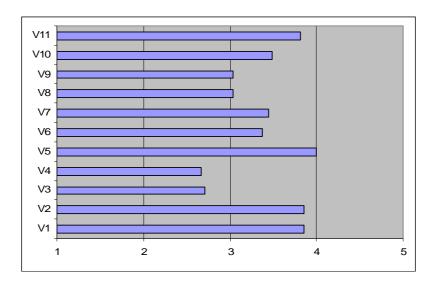
Code	Concept	Code	Concept
V14	Lack of information for consumers	V7	Lack of vertical integration
V13	Lack of homogeneity in the product	V6	Lack of horizontal integration
V12	International competition	V5	Difficulties in differentiating the product
V11	Competition from other regions in Spain	V4	Higher production costs
V10	Insufficient development of commercial channels	V3	Need for land to produce forage
V9	Difficulty in guaranteeing end quality	V2	Aspects of servicing and reproduction
V8	Fragmentation of farms	V1	Herd health questions

Figure 3. Factors Encouraging the Processing and Distribution Sectors to Participate in Non-Intensive Systems for Rearing Beef and Veal Cattle. (Delphi Method). Drawn up by author.



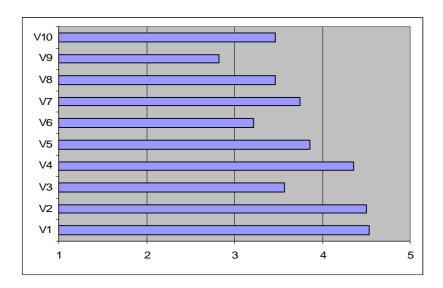
Code	Concept	Code	Concept
V11	Chance to sell an exclusive brand of meat	V5	Consumer concerns over animal welfare
V10	Chance to enter new markets	V4	Social concerns about the environment and the conservation of countryside areas
V9	Contribution to enhancing employment and the economy in rural areas	V3	Possibility of obtaining a price surcharge
V8	Opportunity to contribute to sustainable production and development	V2	Perceptions of consumers
V7	Opportunity to encourage the development of declining country areas	V1	Consumer worries over food safety and food crises
V6	Image of a healthy product of quality		

Figure 4. Principal Disincentives for the Processing and Distribution Sectors to Participate in Non-Intensive Systems for Rearing Beef and Veal Cattle. (Delphi Method). Drawn up by author.



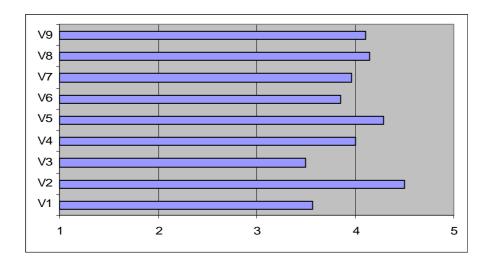
Code	Concept	Code	Concept
V11	Lack of information for consumers	V5	Lack of a sufficient volume of demand
V10	Lack of homogeneity in the product	V4	Lack of vertical integration
V9	International competition	V3	Lack of horizontal integration
V8	Competition from other regions in Spain	V2	Difficulties in differentiating the product
V7	Insufficient development of commercial channels	V1	Higher production and/or distribution costs
V6	Difficulty in guaranteeing end quality		

Figure 5. Evaluation of Strategies to be Implemented to Enhance Integration of the Producer Sector. (Delphi Method). Drawn up by author.



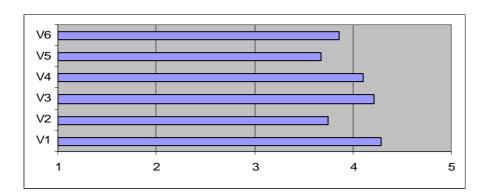
Code	Concept	Code	Concept
V10	Improvement of monitoring and certification procedures	V5	Improvement in product distribution
V9	Reduction in product price to consumers	V4	Increase in promotion of the product
V8	Improvement in product traceability	V3	Improvement in the quality of the meat produced
V7	Reduction in distribution costs	V2	Adequate differentiation of the product
V6	Reduction in production costs	V1	Improvement in consumer information

Figure 6. Factors Determining the Quality of Beef and Veal. (Delphi Method). Drawn up by author.



Code	Concept	Code	Concept
V9	Presentation at the point of sale	V4	Age of animal when slaughtered
V8	Handling and storage after slaughter	V3	Breed of animal
V7	Breeding system	V2	Flavour
V6	Degree of fattening	V1	Geographical origin
V5	Types of food used		

Figure 7. Factors Involved in the Differentiation of Beef and Veal. (Delphi Method). Drawn up by author.



Code	Concept	Code	Concept
V6	Existence of a quality brand	V3	Reliable information on the types of feed or fodder used
V5	Indication of the use of a system respecting animal welfare	V2	Indication of the breed of animal
V4	Indication of the use of a sustainable system that respects the environment	V1	Indication of the geographical origin of products