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The commercialization of pork products of specific qualities

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SUMMARY - In recent years it has been found that consumers tend to give priority to quality rather than quantity in their choice of foodstuffs, thus creating a desire for specific products of a denominated geographical origin. This market could provide a very important boost to rural development, above all in poorer areas, by way of, on one hand, improvement of the farmers' income and, on the other hand, the stabilization of the rural population in these areas. Protected geographical denominations can constitute an important instrument in the defence of the protected products and for the development of the rural world, by guaranteeing equality of conditions of competition between the producers of the products which benefit from these descriptions. In addition, they bring to these products a greater credibility in the eyes of the consumers, as well as help to preserve the local identity of the regions of the Community (Regulation CEE No. 2081/92 of the Counsel of 14 July 1992). With this paper we propose: (i) to make a brief character description of the "salpicão" and "chouriça" sausages from Vinhais, having as our reference the Dispatch No. 139/96 published in the "Diário da Republica" (official Portuguese governmental bulletin) No. 301, 2nd series, of 30 September, 1996; and (ii) to outline an approach to the commercialization of pork products with specific qualities: the case of the Vinhais "salpicão" sausage as well as the "chouriça" sausage made from meat or "linguiça" sausage, from Vinhais.

Key words: "Salpicão de Vinhais", "Chouriça de Carne de Vinhais", "Linguiça de Vinhais", commercialization, rural development, protected geographical indication (PGI).

RESUME - "Commercialisation des produits du porc avec caractéristiques spécifiques". Pendant les dernières années nous avons vérifié une tendance de la part des consommateurs dans le sens de privilégier dans leur alimentation la qualité, au détriment de la quantité de produits alimentaires, en générant une recherche de produits spécifiques avec une origine géographique déterminée. Ce marché peut devenir un important atout pour le développement rural, notamment dans des zones défavorisées, moyennant, d'un côté l'amélioration du rendement des agriculteurs et, de l'autre, la fixation de population rurale dans ces régions. Dans ces conditions, le comité des régions a reconnu la récente adoption de plusieurs produits régionaux (Règlement-CEE-No. 2081/92 du Conseil du 14 juillet 1992 et Règlement-CEE-No. 2082/92 du Conseil du 14 juillet 1992). Les appellations régionales de qualité et d'origine constituent un instrument d'une efficacité et pertinence reconnues, dans la mesure où elles garantissent l'égalité des conditions de concurrence entre les produits de producteurs qui bénéficient de ces dénominations et conduira à une plus grande crédibilité de ces produits aux yeux des consommateurs, ainsi qu'à la préservation de l'identité des régions de la Communauté. De cette façon, nous nous proposons d'effectuer avec cette étude une approximation à la commercialisation de produits de porc avec caractéristiques spécifiques : Saucisson de Vinhais et Andouille de Viande de Vinhais ou Saucisse de Vinhais (Lois No. 138/96). Dans le cahier de spécifications des règles de production qui vont de l'élevage du cochon à l'obtention du produit final furent établies. Ces règles se réfèrent à la race de l'animal utilisé comme matière première, aux normes de fabrication spécifiques, au type de boucher utilisé pour le procédé de déformation et à la zone géographique définie pour la transformation.

Mots-clés : Saucisson de "Vinhais", Andouille de "Vinhais", commercialisation, développement rural, indication géographique protégée (IGP).

Introduction

The raising of pigs has evolved from a small source of pork meat in the farm, for consumption by the family of the farmer, to a profit-orientated business, with intensive production, which is capitalised and highly mechanised. The popularity of pork meat varies greatly between the different zones of the world: about 60% of the meat consumed in the Scandinavian countries is pork, while in the European Community as a whole it is supposed that the figure is 50%, in Japan 45%, in North America 35% and in Argentina only 5% (Whittemore, 1996).

In Portugal the global division of meat production reveals that pork meat is the one which has the greater share, representing about 40% of total production (INE, 1995). At this moment it is estimated that this proportion has risen to 45%. The consumption per inhabitant evolved from 30 kg per year in 1990 to 34.5 kg in 1994 (IACA 1997).

The markets tend to be divided into two types: one utilises pork as raw material for the preparation of a wide variety of manufactured meat products in order to satisfy a permanent need to have meat available at a low price, while the other, accompanied by an important growth in demand, offers good quality pork meat and ham. This latter market demands carcasses with a low level of subcutaneous fat, an adequate level of intermuscular fat and an important quantity of lean tissue, which gives the consumer a good perception of pleasure in the eating. This demands that the meat be succulent, tender and tasty, avoiding all dryness, paleness, marks or hardness (Whittemore, 1996).

Recently there has been noticed a tendency on the part of consumers to give priority to quality rather than quantity in their choice of food products, thus creating a demand for specific products of determined geographical origin. This market can bring a very important boost to rural development, above all in poorer areas, by way of, on one hand, improvement of the income of the farmers and, on the other hand, through the stabilization of the rural population in these areas.

With this paper we propose to make a brief reference to some of the characteristics and aspects of the commercialization of pork products with specific qualities: the case of the PGI "salpicão de Vinhais" and "Chouriça de Carne de Vinhais" also known as "Linguiça de Vinhais" (two kind of traditional smoked sausages).

Protected geographical indication (PGI)

Faced with the diversity of products existent in the market and the quantity of information furnished about them, the consumer needs succinct and clear information on their origin. These circumstances have led Portugal, as they have other member states of the European Union, to the creation of Protected Geographical Indication (PGI) for various agricultural and food products.

Regulation (EEC) No. 2081/92, of the Counsel of 14/7, published in the Official Journal of the European Communities No. L 208, established the community's legal framework relative to the protection of geographical denominations and to the denominations of origin of agricultural products and of foodstuffs. According to this Regulation, Article 2, No. 2, line b), a product with geographical Indication (PGI) should fulfil the following conditions: (i) native of this region, this determined area or this country; and (ii) whose reputation, established quality or other characteristic can be attributed to this geographical origin and whose production and/or transformation and/or preparation occur in the demarcated geographical zone.

The products studied in this paper is "salpicão de Vinhais" and "Chouriça de Carne de Vinhais" also known as "Linguiça de Vinhais" (two kind of traditional smoked sausages).

Pork products with specific qualities

In the description in the register of specifications and obligations of "Salpicão de Vinhais" sausage, published in the Official Journal of the European Communities No. C 273, of 9 September, 1997, with the title "Regulation (EEC) No. 2081/92 of the Counsel. Petition of Register: Article 5. PGI. National process number: 76/97", point 4, line f), we can read:

"Towards the end of the 18th century, in the Terra Fria region of Trás-os-Montes, chestnuts, potatoes and rye bread sustained the local population; pork meat was the alimentary supplement, furnishing proteins and fats. The long history in the region of the raising of pigs can even today be witnessed by the existence of various zoomorphical sculptures, known as "berrões", "porcos", "verracos" or "toiricos", present in various localities in Trás-os-Montes. In order to be able to consume the pork meat throughout the whole year, ways of preserving it were developed: an ancestral art, transmitted from one generation to the next.

The "fumeiro" (smoked meat), as this group of foodstuffs is called, is very dependent on the cold climate of this region, which calls for the constant company of a fireplace. This provides unique conditions for smoking meat (a rather thin and gradually produced smoke, from the firewood of the region, mainly oak and chestnut), to which is joined the constant humidity from the cauldron of water which is always on the fire. Of great importance is the careful way in which the pig is fed, with regional products, among which stands out pumpkin, potato and chestnut, this last being essential for the finishing touch.

The natural conditions of the region, its products, the form in which the pigs are fed, the transmission within the family of the ancient lore concerning its fabrication and the profound roots of the local people, who keep these traditions alive, all make the Vinhais salpicão a product of unique characteristics".

This same reference is made in the register of specifications and obligations of the Vinhais meat "chouriça" or "linguiça", published in the Official Journal of the European Communities No. C 273, of 9 September, 1997, with the title "Regulation (EEC) No. 2081/92 of the Council. Petition of Register: Article 5. PGI. National process number: 77/97, point 4, line f).

The pork products with specific qualities which were studied in this paper included: the Vinhais "salpicão" and the meat "chouriça" or "linguiça" of Vinhais. In the following sections we will describe each of these products.

The Vinhais "Salpicão"

In the terms of the Dispatch No. 139/96, line A) of Annex 1, the definition of the Vinhais "salpicão" sausage is given, along with the manner of obtaining it, its characteristics, its manner of presentation to the public and its labelling.

Definition

By Vinhais "salpicão" is understood the sausage, smoke-cured, produced in the geographical area of the districts of Alfandega de Fé, Bragança, Carrazeda de Ansiães, Macedo de Cavaleiros, Mirandela, Torre de Moncorvo, Vila Flor and Vinhais. It is made up of pork loin and tenderloin obtained from the butchering of pigs of the Bísara race or those which are interbred with this race, as long as they have at least 50% Bísara race blood. This meat is introduced into the large intestine of the pig so as to produce a rectangular and cylindrical form and then smoked. The meat which is used is properly seasoned with salt, red or white wine from the region, water, garlic, paprika and/or bay leaf.

Manner of obtaining the product

In the register of specifications, published in the Official Journal of the European Communities No. C 273, of 9 September, 1997, with the title "Regulation (EEC) No. 2081/92 of the Council. Petition of Register: Article 5. PGI. National process number: 76/97", point 4, line e), we can find the regulations to be observed by the producers of pigs and Vinhais salpicão sausage, the criteria for the authorization of piggeries, the means of identification and registry of the animals, the regulations for alimentation and slaughter, the butchering and preparation of the meat, its seasoning, the stuffing of the sausage, the method of cooking the tripe, the smoking and the final conservation of the sausage.

The manner of obtaining the Vinhais "salpicão" covers the phases of: butchery (the pork loin and tenderloin is cut into cubes of approximately 5 cm); seasoning (done in two phases, with salt, water, wine, bay leaves, garlic and paprika); stuffing (after having left the meats to repose for a while, the filling of the large pig intestine is done, into "tripe" previously cut to the right size and with one of the ends sewn up, the other end being tied up after the meats are well compacted in. In order to close off the "salpicão" two consecutive knots are tied, the tripe is turned once and only then is the final knot tied.); smoking and curing (the smoking is done over a low fire, by the action of low, well-graduated heat based on dry firewood, mainly from oak and chestnut, after which there follows a period of curing

in cool dark places until the sausages have acquired the flavoursome and aromatic characteristics by which they are distinguished).

The fresh pork loin and tenderloin must be obtained from carcasses of the Bísara race of pig or those with at least 50% Bísara race blood, with a minimum weight at slaughtering of 100 kg and an age of between 9 and 18 months. The meat must be cut into cubes of around 5 cm, followed by the traditional seasoning process carried out in two distinct phases and submitted to a process of transformation which includes, beyond those phases already cited, the filling of the tripe cut to size and sewn up in one of the extremities before the filling and tied up with a double knot plus a turn on the other end after the filling, the smoking over a low fire with dry firewood, mainly oak and chestnut, and the curing. The phases of smoking and curing cannot take less than 40 days altogether.

Characteristics

The final product displays the following characteristics:

External. Form and aspect –straight, cylindrical sausage, with 15 to 20 cm length and 5 to 8 cm diameter, sewn with cotton thread at one of the extremities and tied up with a double knot, followed by the turning of the sausage and another knot at the other end. Dark red in aspect, hard to semi-hard in consistency.

Internal. Colour and aspect of a slice –a compact slice, of vivid red colour, in various tones. Taste and aroma–agreeable taste, very characteristic, with a very light saltiness (low *NaCl* levels classify this as the least salty of the Portuguese smoked sausages). Agreeable aroma which is *sui* generis. Smoky flavour and aroma.

Chemical analysis. Raw protein –minimum of 32%, raw fats –maximum of 30%, humidity -maximum of 50%, Salt content–maximum NaCl of 5%

Manner of presentation to the public

The Vinhais "salpicão" can be presented to the consumer whole, in chunks or in slices.

To be able to benefit from its geographical indication, that Vinhais "salpicão" which is presented in chunks or slices must be pre-packaged at the point of origin, in material proper for foodstuffs.

Labelling

Apart from that which is required for packaged foodstuffs in terms of labelling by the law, the label should also have the phrase "Salpicão de Vinhais – Geographical Indication" and the certification stamp, placed there by the appropriate private control and certification body.

The Vinhais meat "Chouriça" or "Linguiça"

In the dispatch No. 139/96, line B) of annex II, is given the definition, the manner of obtaining, the manner of presentation and the labelling of the Vinhais meat "chouriça" or "linguiça":

Definition

By Vinhais meat "chouriça" or "linguiça" is understood that smoked-cured sausage produced in the geographical area of the districts of Alfandega de Fé, Bragança, Carrazeda de Ansiães, Maœdo de Cavaleiros, Mirandela, Torre de Moncorvo, Vila Flor and Vinhais. It consists of pork loin, tenderloin, pork shoulder, pork belly, pork scraps and fats, obtained from the butchering of pigs of the Bísara race or from products of the interbreeding of this race, as long as they have at least 50% of Bísara race blood. This meat is introduced into tripe (small intestine), basically of pig or cattle, with a cylindrical

horseshoe shape. The meats and fats used are properly seasoned with salt, red or white wine of the region, water, garlic, sweet or hot paprika and bay leaves.

Manner of obtaining the product

The rules to be followed by the producers of pigs and of the Vinhais "chouriça" or "linguiça", the criteria for authorization of piggeries, the means of identification and the registry of the animals, the regulations for alimentation and slaughtering, the butchering of the meats and the fats, the seasoning, the filling, the tying of the tripe, the smoking and the conservation are those referred to in the respective register of specifications, published in the Official Journal of the European Communities No. C 273, of 9 September, 1997, with the title, "Regulation (EEC) No. 2081/92 of the Council. Petition of register: Article 5. PGI. National process number: 76/97", point 4, line e).

The manner of obtaining the Vinhais meat "chouriça" covers the phases of: butchering (the pork loin, tenderloin, pork shoulder, pork belly and scraps of pork meat is cut into cubes of approximately 3 cm in size); seasoning (carried out in two phases, with salt, water, wine, bay leaves, garlic and paprika); stuffing (after leaving the meats to repose for a while, the filling of the tripe (small intestine) is done while at the same time the tripe is punctured with needles to facilitate the exit of air. The tripes are completely filled up, and then the division into sausages is made, by compression, after which they are tied. When the meats are well compacted, the ends are tied, two consecutive knots being made, the tripe then turned once and only at that point the final knot done. The same piece of cotton thread is used for both extremities of the sausage, thus giving the sausage its horseshoe shape); smoking and curing (the smoking is done over a low fire by means of low, well-graduated heat with dry firewood, mainly oak and/or chestnut. Once the smoking is finished there follows a period of curing in cool, dark places until the sausages obtain the flavoursome and aromatic characteristics proper to the Vinhais meat "chouriça").

The fresh meats and fats must be obtained from the carcasses of pigs of the Bísara race, or those with at least 50% of Bísara race blood, with a weight at slaughtering of at least 100 kg and an age between 9 and 18 months. The meat and fat are subjected to butchering into cubes of around 3 cm in size, followed by the traditional seasoning process carried out in two distinct phases. The meat is then submitted to a process of transformation which includes, apart from those phases already cited, the stuffing into the small intestine of pigs or cattle, the tying with a double knot with a turn at the extremities, the smoking over a low fire of oak and chestnut wood and the curing. The phases of smoking and curing may not exceed a total of 35 days.

Characteristics

The final product presents the following characteristics:

External. Form and Aspect - cylindrical horseshoe-shaped sausage, length: 30 to 35 cm, diameter: 2 to 3 cm, tied at both ends with a double knot followed by the turning of the sausage and a new knot. Dark red aspect, hard to semi-hard consistency.

Internal. Colour and aspect of a slice –a compact lice, the internal colour is vivid red and white, with various tonalities, not homogenous. Flavour and aroma –agreeable taste, very characteristic. Agreeable aroma, which is *sui generis*. Smoky taste and aroma.

Chemical analysis. Raw protein –minimum of 20%, raw fats –maximum of 40%, humidity -maximum of 50%, salt content –maximum *NaCl* of 6%

Manner of presentation to the public. Vinhais meat chouriça or linguiça can be presented whole or in chunks.

In order to be able to benefit from the geographical designation, the Vinhais chouriça or linguiça must be pre-packaged at origin, in appropriate material for foodstuffs.

Labelling. Apart from that which is required for packaged foodstuffs in terms of labelling by the law, the labelling should also have either the phrase "Vinhais Meat Chouriça–Geographical Indication" or "Vinhais Linguiça –Geographical Indication" plus the certification stamp, placed there by the appropriate control and certification body.

Commercialization

In a study done by us in the north-eastern Transmontano region we found that 35% of the pork production is destined for the production of smoked sausage for resale under the names of "presunto", "salpicão", "linguiça", "alheira", "chouriço verde", "chouriça boche", "chouriço doce", "chouriço de pão", "chouriço chaviano", "butelo", "pá", "chispe" and "queixada".

Of all the products mentioned above only the Vinhais salpicão and meat chouriça or linguiça had national protection under the dispatch No. 139/96, published in the "Diário da República" No. 301, ii series, of 30 September of 1996. They are thus authorized to be commercialized under the names "Vinhais *Salpicão* – Geographical Indication" or "Vinhais *Linguiça* – Geographical Indication" along with the certification stamp, placed there by the appropriate control and certification body. In the marketplace we have not yet seen nor do we know of such commercialization of products under these names.

The Vinhais "salpicão" and "linguiça" which has appeared in the market under this designation has referred exclusively to those products produced in the district of Vinhais itself.

The principal agents of commercialization and promotion have been the Town Council of Vinhais in collaboration The National Association of Breeders of the Bísara Race of Pig and the Natural Park of Montesinho through the organization of the Vinhais Fair. This began in February 1980 and has continued annually until our days (Table 1).

Year	Date	No. of producers	No. of visitors	Solds (kg)	Total (in 1,000 esc)
1995	-	-	5,000		
1996	9 a 1 de Feb.	-			
1997	7 a 9 de Feb.	200	20,000		20,000
1998	6 a 8 de Feb.	240	33,000	6,000	35,000

Table 1.Progressive Figures of the Vinhais Fair of Smoked Sausages Vinhais Town Council
(1995-1998), quoted by Alves, 1998)

Table 2 shows us the principal products sold in the Vinhais Fair of Smoked Sausages in 1997, where highlights are the sale of 10,406,450 escudos worth of salpicão and 592,200 escudos worth of "linguiça" at 10,000 esc. and 7,00 esc. per kilo, respectively.

The commercialization of the Vinhais "salpicão" and "linguiça"also occurs: (i) directly from the farmer to tourists or other passers-by. This type of transaction, although being found at any time of the year, predominates in winter; (ii) in the regional handicraft fairs; (iii) in the regional gastronomic fairs; and (iv) gatherings of hunters.

In recent years there have also appeared "Smoked Sausage Fairs", promoted by the supermarkets in the region.

It is worth pointing out that these products are not to be found or only found with difficulty in normal sales points for industrially produced sausages such as butcher's shops.

The Superior School of Technology and Management of the Polytechnical Institute of Bragança has a project entitled "Ruralnet – Service for Information and Electronic Commerce", which has as its mission to create an organization which brings small businesses in the rural world together and allows the formation of competitive strategies based on information technologies,

whose objective is to support the commercialization of these products, in the context of the global market. It has been on-line on the Internet since the 1st of October of 1998, at the address www.ruralnet.pt.

Products	kg sold	kg not sold	kg not sold (\$)	kg not sold (\$)
"Salpicão"	1,040,645	24,330	10,000	10,406,450
"Linguiça"	846,000	7,090	7,000	592,200
"Alheira"	583,260	29,900	1,200	699,912
"Chouriço Verde"	133,490	,540	1,000	133,490
"Chouriça Boche"	52,580	-	1,000	52,580
"Chouriço Doce"	110,830	5,700	1,000	110,830
"Chouriço Pão"	51,970	10,000	1,000	51,970
"Chouriço Chaviano"	5,070	-	1,000	5,070
"Butelo"	43,920	-	1,000	43,920
"Presunto + Pás"	610,810	37,873	1,300	794,053
"Chispe + Orelha + Queixada"	49,340	10,180	1,000	49,340
"Gordura + Unto"	12,900	-	1,000	12,900
Total	3,540,815	125,613	-	12,952,715

Table 2. Products Sold in the Vinhais Fair of Smoked Sausage in 1997 (Natural Park of Montesinho, 1997)

Conclusions and suggestions

The petition for community registration of the Vinhais meat "chouriça" or "linguiça" and the Vinhais "salpicão" as having Protected Geographical Denomination has already had favourable consideration (Dispatch 139/96, of 30 September, published in the II series of the "Diário da República" No. 301) by the Secretary of State for Agriculture and Rural Development.

From that moment on, according to the dispatch cited above, these products have national legal protection, being thus able to display the lettering "Vinhais Meat Chouriça – Geographical Denomination" or "Vinhais Linguiça- Geographical Denomination".

It is believed that the community protection provided by geographical designations provides an important instrument in the defence of rural products and rural development, in as far as they guarantee equality of conditions between the producers who benefit from these descriptions. It is also believed that it will lead to a greater credibility of these products in the eyes of the consumer, as well as the preservation of the identity of these regions of the community. We hope that these actions will come to effectively contribute to the income of the farmers and at the same time to the rural development of this region.

At this moment a positive dynamism can be noted in the area of traditional pig raising. This evolution has been motivated among other reasons by these measures taken to ensure the protection of traditional products, by the support given to the recovery and the defence of indigenous races headed for extinction (as is the case of the Bísara race), and by the augmentation of demand for these products, etc.

On one hand, we are today facing a favourable situation for the recuperation of the Bísara race of pig, considered to be nearly extinct, and on the other hand, we see a favourable situation for a boost in income for local farmers resulting from the transformation of the meat of this animal into sausages, especially the Vinhais "salpicão" and "chouriça".

However, in our opinion it is still necessary to intervene with: (i) adequate politics (re the valuation of the meat, its commercialization, etc.); (ii) the Association of Breeders (who need a greater capacity to intervene); (ii) the pig breeders (creating more farmers and bettering their productivity); (iv) the population in general (above all the consumers, not only in their demand for these products but also in their demand for quality in the products); and (v) keeping a tight control and vigilance over the

regulations of production of the Vinhais "salpicão" and "Chouriça" or "Linguiça", so as to safeguard their reputation which has been gained over many generations.

References

- Alves Gonçalves, C.M. (1998). Matérias Primas Sua Influência no Produto Final "Enchidos de Raça Bísara". In: 1^{as} Jornadas Internacionais de Suinicultura. UTAD, Vila Real, pp. 175-176.
- CE (1997). Salpicão de Vinhais. In: *Jornal Oficial das Comunidades Europeias* No. C 273. Regulamento (CEE) No. 2081/92 do Conselho. Pedido de Registo: Artigo 5º. IGP. Número nacional do processo: 76/97, pp. 6-7.
- CE (1997). Chouriça de Carne de Vinhais ou Linguiça de Vinhais. In: *Jornal Oficial das Comunidades Europeias* No. C 273. Regulamento (CEE) No. 2081/92 do Conselho. Pedido de Registo: Artigo 5º. IGP. Número nacional do processo: 77/97, pp. 8-9.
- CEE (1992). *Jornal Oficial das Comunidades Europeias* No. L 208, de 24 de Julho de 1992. Regulamento (CEE) No. 2081/92 do Conselho de 14 de Julho de 1992. Comunidade Europeia, pp. 1-8.
- IACA (1997). Anuário 96/97. Associação Portuguesa dos Industriais de Alimentos Compostos para Animais, Lisboa.
- INE (1995). Portugal Agrícola. Lisboa, Instituto Nacional de Estatística.
- PORTUGAL (1996). Despacho No. 139/96. Diário da República No. 301, IIª Série, de 30 de Dezembro.
- PORTUGAL (1997). Despacho Normativo No. 47/97. Diário da República No. 184, lª Série B, de 11 de Agosto.
- WHITTEMORE, C. (1996). Ciencia y Prática de la Producción Porcina. Editorial Acríbia, S.A., Zaragoza, Spain.