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Pig production systems based upon traditional local breeds
Sustainable use of natural resources in case-studies from France and Italy

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Abstract

Following the example of Iberian pigs reared in Dehesa system, several areas of Mediterranean Europe have spent efforts in recovering traditional local pig breeds, characterized by slow growing and high adiposity. The strategy of local actors is focusing on the pigs' way of life for ensuring high added value for dry cured hams. Sometimes, the traditional production system was still in use with sylvo-pastoral logics (chestnuts and acorns consumption). But in most cases, breeders had to re-invent production systems in order to valorize such animals, emphasizing the free range in forests and pastureland areas and the role of grass income. We present some situations from France and Italy where Geographical Indication is applied or obtained. The main traits of the production systems and the role of the natural resources in such specifications are underlined. Stocking rates but also types and quantities of additional feedstuffs are often required as criteria for managing raw material qualities but not really impact of pigs on their environment. Seasonality of production with a compulsory use of forests during a finishing period seems to be a main issue for a sustainable and environment-friendly way. We discuss the potential unbalanced use of natural resources, and the importance of control plan for preventing environment wastes. Outdoor production fashion induced by modern consumer preferences should take into account the potential negative consequences on the natural resources.

Introduction

The example of Iberian pigs reared in Dehesa system and dedicated to dry cured ham production – the famous “pata negra” – of high level of quality, has given some new credibility to the local pig breeds still existing. These traditional local pig breeds are characterized by slow growing and high adiposity, considered as defects for the conventional lean pig industry. So, numerous traditional breeds already disappeared and the remaining breeds' census has shown severe decreasing.

Due to the Iberian example, several areas of Mediterranean Europe have spent efforts in recovering their local traditional pig breed oriented toward the production of dry cured hams (Pugliese and Sirtori, 2012). We decided to focus our analysis on the

French and Italian situations where a production of dry cured ham is connected to the mandatory use of local pig breeds in Geographical Indication.

Rationale

For most of these local traditional pig breeds, the strategy of local actors is focusing on the pigs' way of life for ensuring high added value for dry cured hams. A large part of the arguments and communication are showing the pigs in their natural environment. As targeted consumer cluster, urban people ready to pay more for typical products has integrated that such outdoor production seems better for the pigs' welfare, in opposition to the industrial pig production where animals are reared in indoor units without any contact with natural resource.

Sometimes, the traditional production system was still in use with sylvo-pastoral logics (chestnuts and acorns consumption) and the outdoor production system is more or less a modern adaptation of the traditional system. But in most cases, breeders had to re-invent production systems in order to valorize such animals, emphasizing the free range in forests and pastureland areas and/or the role of grass income.

To what extent the outdoor pig production of local traditional breeds dedicated to typical dry cured hams is using the natural resources in a sustainable way?

Material and methods

We present some situations from France and Italy where Geographical Indication is applied or obtained. In France, 3 cases with 2 of them are still applying, "Noir de Bigorre" ham (NB) based on the Gascon pig breed and "Kintoa" ham (KT) based on the Basque pig breed; and one already obtained at national level and to be registered very soon at European level ("Corsican" ham (CO) names "*prisuttu*" based on the Nustrale pig breed. In Italy, 2 cases with one still applying, "Nero dei Nebrodi" ham (NN) named "*prippuni*" based on the "Nero Siciliano" pig breed; and one already registered at European level, "Cinta Senese" pork meat (CS) based on the Cinta Senese pig breed and used for producing dry cured hams.

The main traits of the production systems and the role of the natural resources in such specifications are object of analysis. The code of practices is interesting to consider as a way to connect the animals with their natural environment and, at the same time, as a way to assess the impact of herds on the areas as well as the impact back on the animals for raw material quality and for health and welfare.

Main findings

A linkage between raw material qualities and the use of natural resources

In the usual presentation of the traditional local breeds, genetics seem to be determinant for the typical characteristics of the hams. But, if so, terroir does not exist anymore. The very first justification of protecting the denomination is the genotype-environment interaction. Intra-muscular fat is often presented as an evidence of compensatory growth expression of such interaction. Several values are proposed for the various hams: 6% for CO and 2.5% for NB and CS. For KT, high level of IMF is mentioned but without any targeted value. No indication is mentioned for NN.

According to the work of Petron et al. (2006), neophytadiene content is presented as evidence for grazing activity. This molecule is mentioned for NB, with an obligation for the 6 last months of finishing period to let the pigs on pasturelands. But no targeted value is given for the moment. And it seems to disappear all along the ageing of the ham.

Oleic acid is given as an evidence for the consumption of acorns and chestnuts with a minimum value of 45% for the CO. For NB, a minimum of 51% of monounsaturated acids is required with a minimum of 47% of oleic acid.

Seasonality of production with a compulsory use of forests during a finishing period seems to be a main issue for a sustainable and environment-friendly way, only for the CO. The finishing period (autumn) is determining the slaughtering period (end of November till end of March).

As another issue of the analysis of the 5 specifications, the types and quantities of additional feedstuffs are often required as criteria for managing raw material qualities. CO has requirements for the feedstuffs content. Maize is forbidden for the last 90 days before slaughter. For NB, feedstuff must contain at least 70% of cereals and

less than 3kg are distributed by animal by day. In several cases, GMO are forbidden for environmental but also commercial reasons.

For CS, we notice a limited feedstuff distribution: the permitted daily food ration is allowed for pigs over four months of age, and must not exceed 3 % of the live weight of the animal so as to guarantee the animals a normal dietary input. In the case of CO, after one month of finishing pasture with only chestnuts and/or acorns, the producers are allowed to distribute barley with a maximum of 4 kg/day/pig. But, in this case, they lose the mention “only with chestnuts and acorns” supposed to give more added value to the dry cured ham.

Few elements for the management of natural resources

But the code of practices is not really including the impact of pigs on their environment. In general, GI specifications are not conceived as a way to manage such impact and public authorities are refusing to include into the code of practices any element of livestock management not directly responsible of the product final quality.

As an indirect influence, we could consider that natural resources are under control by the stocking rates. For NB, 25 pigs by hectare of grassland. For KT, 40 pigs by hectare as a maximum. For CS, the animals intended for slaughter must be reared in the wild/semi-wild once they are four months old. The maximum limit per hectare is 1 500 kg live weight. The pigs must be allowed to forage daily in areas of land that are either fenced off or not, and that may include shelters for the night and/or for inclement weather. No precision is given for NN. And for CO, apparently more extensive, only 5 pigs by hectare are allowed during growing period and for the finishing period 8 pigs by hectare is a maximum. Such rule seems completely natural for the breeders according to their experience.

In the specification, the criteria for identify the pasturelands have to be analyzed. For CS, the “defined geographical area is distinguished by its mixed woodland, rich in types of oak tree, perfect for acorn production, and for its small amount of arable land”. For NN, free range is required after 5 month but more classical outdoor system is allowed. For KT, this obligation starts at 7 month old. And the pasturelands are of 2

types: i) pasture with grass available for the pigs (spontaneous or cultivated grass) and ii) forests with chestnut-trees and/or oak-trees.

Finally, we must mention the level of activities for the animals obliged to explore the lands and to make some km per day. Such activity is evidenced by the intense color of the muscles (Lopez-Bote *et al.*, 2008). It should be objectified by the heminic iron, but no targeted value is given in the specifications.

Discussion

Diversity of situations and need for assessment

We discuss the potential unbalanced use of natural resources. A distinction has to be made between traditional production systems and re-invented systems. Field studies can show degradation of the forests and pastureland by the herds, in particular during the wet period. So, we must emphasize the importance of control plan for preventing environment wastes. For example, Pugliese (Com. Pers.) as member of the certification body for CS, observed several problems in assessing the stocking rate as animals' weight is varying a lot and very quickly.

Global or local environmental issues?

Life-cycle analysis can be proposed as a relevant method for comparing several production systems. One situation (KT) has been part of a study for environmental impact. Following the methodological proposal from Edwards (2005), the study has compared conventional intensive systems with traditional ones (KT and 2 other systems) and organic ones within a European project (QPorkChain). Dourmad *et al.* (2013) reported the results of such comparison. By estimating the equivalent of Green House Gas emission by animal, the traditional systems show a very bad performance: They are producing a lot of GHG (+54% in average) when expressed by kg of pork meat. But, expressed as equivalent of GHG by hectare, traditional systems using a great surface of pasturelands and forests show an excellent performance. So, the way to calculate the impact (by animal vs by hectare) is influencing a lot the results of our traditional systems. And we could say with

Dourmad *et al.* (2013), that such traditional systems are more sustainable for the local or territorial impact than for the global impact.

Conclusion

We need to improve our methodologies for assessing the environmental impact of pig production systems when based upon natural resources (Edwards and Casabianca, 1997). The future of this association local breed and outdoor system is not only commercial (as dry cured hams are sold at very good prices) but also environmental. Methods like life-cycle analysis should be developed in the next future in order to help managing the impact of pig production on natural resources.

This issue is of real interest as outdoor pig production is becoming a real fashion induced by modern consumer preferences. But, such new value scale commonly accepted in our societies should take into account the potential negative consequences on the natural resources.

References

- Dourmad J.Y., Ryschawy J., Trousson T., Bonneau M., Gonzalez J., Houwers W., Hviid M., Zimmer Ch., Nguyen T.L.T., Morgensen L., 2013. Évaluation par analyse de cycle de vie de la durabilité environnementale de systèmes contrastés de production porcine en Europe. Journées recherches porcines en France, Vol 45, 109-114
- Edwards S.A., 2005. Product quality attributes associated with outdoor pig production. *Livest. Prod. Sci*, 94, 5-14.
- Edwards, S.A., Casabianca, F., 1997. Perception and reality of product quality from outdoor production systems in Northern and Southern Europe. In: Sorensen, J.T. (Ed.), *Livestock farming systems—more than food production*, EAAP Publication, vol. 89. Wageningen Pers, 145-156.
- Lopez-Bote C.J., Toldra F., Dazac A., Ferrer J.M., Menoyo D., Silio L., Rodríguez M.C., 2008. Effect of exercise on skeletal muscle proteolytic enzyme activity and meat quality characteristics in Iberian pigs. *Meat Science* 79, 71-76.
- Petron M.J., Muriel E., Tejada J.F., Ventanas J., Antequera T., 2006. Effect of duration of the Montanera diet on the hydrocarbon fraction of intramuscular lipids from Iberian dry-cured ham; characterization by gas chromatography. *Journal of the science of food and agriculture*, Vol 86, N°7, 1040-1045.
- Pugliese C., Sirtori F., 2012. Quality of meat and meat products produced from southern European pig breeds. *Meat Science* 90, 511-518.