



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Agricultural Development and Regulation: The Case of Pig Rearing in Guadeloupe, French West Indies

Marie-Françoise Zébus^{1*}, Gisèle Alexandre¹, Jean-Louis Diman¹,
Edouard Despois², and Alain Xandé²

"When pigs dream, they dream of washing-up water" Dutch proverb

Abstract

The question of development of livestock rearing is currently inseparable from that of regulation in the European Union because of the growing demands of food safety, animal health and the environment. The French overseas departments are governed by French national legislation, necessarily conforming with European Union legislation. The development of livestock rearing therefore has to be subject to at least a minimum respect for regulations resulting from a very different socio-economic system. By taking as an example pig rearing in Guadeloupe (French West Indies) the work is aimed at identifying the real differences between current livestock rearing practices and legal requirements, and at suggesting some ideas for a suitable development policy. The communication begins by describing the diversity of breeding systems, particularly the social and economic importance of herds which do not conform to the dominant model. The discussion goes on to consider the need for development, training and research institutions to keep in mind these breeding systems. The working practices in the various types of livestock farm are then compared with the current regulatory framework by using the double criterion of the Law and the Rule. The departures found, both numerous and sizeable, provide food for a discussion about the opportunity and means of bringing these farms into line with the standards, a process which should be part of the agricultural and rural development policy.

¹INRA, Unité Agropédoclimatique de la Zone Caraïbe, Centre Antilles-Guyane, Domaine Duclos, 97170 Petit-Bourg, Guadeloupe.

²INRA, Unité de Recherches Zootechniques, Centre Antilles-Guyane, Domaine Duclos, 97170 Petit-Bourg, Guadeloupe.

*Corresponding author: Tel.: 590 590 25 59 86, Fax: 590 590 94 16 63, e-mail: zebus@antilles.inra.fr

INTRODUCTION

The question of development of livestock rearing is now indissociable from that of regulation in the European Union, in the industrialised countries generally as well as for their suppliers of animal products. On the one hand, the "mad cow disease" crisis and epidemics such as foot-and-mouth disease have brought to the forefront the problems of food safety and animal health. On the other hand the growth of environmental preoccupations has underlined the risks associated with industrial rearing methods. The French overseas departments are governed by French national legislation, which must conform to that of the European Union. The development of rearing in these regions (called "extra-peripheral") must inevitably therefore have some minimal respect for the regulations inspired by different socio-economic systems. When considering development, it seems useful to be able to identify the real differences between the practices being used for livestock breeding and the law, and to consider how to bring the former in line with the latter. The example chosen is that of pig rearing in Guadeloupe (French West Indies). These reflections arise partly as the result of a study of pig production systems (Zébus *et al.* 2001) based on a survey of breeders and field technicians and partly on meetings with the administrative services concerned and consultation of legal documents.

The description of the diversity of pig rearing systems shows how many livestock enterprises develop without any public support. Next we introduce a theoretical

framework chosen to analyse farmers' practices; it makes use of the double criteria of the law and the rule. Thirdly, the main features of the legislation governing pig production are explained. Then follows an analysis of the situation of the pig production systems with respect to this regulation. The discussion centres on prospects for development.

DIVERSITY IN GUADELOUPEAN PIG REARING

In Guadeloupe, the authorities and professional agricultural organisations consider "real pig farming units" and those which fit the model promoted in the islands since the end of the seventies. This "modern", "intensive", "standard", "industrial", or "professional" type of unit, is based on the type of piggery used in metropolitan France, particularly in the west. It represents, in fact, a complete "advisory package" of exotic breeds, feeding with commercial concentrates, standardised specialised buildings and fittings, at least a dozen sows, an intensive reproductive rate, technical management of herds based on the numerical productivity of the sows, and mass marketing. The other pig herds, which are often begrudged the title of pig breeding units, are listed as "traditional livestock units" which are barely tolerated, not deserving of consideration, let alone help, and not serving as a basis for any other model. In this sense, the intensive industrial type of unit, which monopolises the collective resources, can be described as the dominant model (DM).

It is reasonable to wonder if the present pig herd in Guadeloupe really is organised in

these two extreme forms: the "traditional" unit - a hangover from the past - as against a "modern" unit.

Pig Rearing in Guadeloupe from Statistics

According to the 2000 agricultural census (SCEES 2001) there were 1,933 farms (16% of the total number of farms) with at least one breeding sow or which had produced in the preceding year at least three pigs (Figure 1). Less than 2% of farms had more than 20 breeding sows; they made up 19% of the total breeding sow herd. According to the specialist technicians, these were essentially the farms belonging to the dominant model. In fact one has to have at least 25-30 sows to belong to the Guadeloupe pig breeders' union (SEPG).

On the other hand, 90% of the farms surveyed had at most three breeding sows, representing more than half of the total number of breeding sows. These small units, therefore, contribute significantly to the supply of the Guadeloupean market, even after taking account of productivity per sow, which is probably lower than that of the larger units. Moreover, a class of medium-sized farms appeared (with 4-19 breeding sows), representing 24% of the herd of breeding sows even though they only represented 8% of the farms. It seems likely that these medium-sized farms may differ from the "traditional" small units.

A survey carried out within the Land Reform area has thrown light on the diversity of the corresponding rearing systems.

Diversity of Rearing Systems

The most recent Land Reform led to the settlement, during the eighties, of more than 680 farmers on plots of about 9 ha. They have to abide by certain conditions and do not own the land, but receive above-average supervision and preferential access to the irrigation supply. In 2000-2001 the technicians supervising the farmers concerned recorded 105 farms with at least one pig, i.e. 15% of the settlers. The 55 farms whose size was known had a size structure similar to that found in the Agriculture Census: a majority (77%) with at most 3 sows as opposed to a minority of farms with more than 40 sows, a class of farms of medium size (6-12 sows), and none with between 12 and 40 sows (Zébus *et al.* 2001).

The survey was conducted on a sample of 20 farms chosen for their herd size, geographical location and the overall type of farming. The pig production units surveyed differed according to various criteria: size, breeds used, reproduction policy, feeding strategy, sanitation methods and marketing practices. Four kinds of pig-breeders were thus identified within the surveyed sample: those belonging to the dominant model, traditional rearing units, small farms undergoing transition and innovative farms.

Type 1: Pig farms of the dominant model:

Pig farms of the dominant model have more than 40 sows, an intensive reproductive rate and hence high productivity. Feed is essentially of commercial origin and differs according to the physiological stage of the animals. These are the only ones to have

purpose-built, well-equipped buildings; which apply the sanitary measures prescribed in the region and which use paid labour and sell by mass marketing. These are full-time farmers with a relatively high technical knowledge of the region. However the place of the rearing unit within the production system (i.e. whether the farmer specialises in pig-breeding or has other enterprises) seems to introduce some diversity into this group. Moreover one can distinguish breeders belonging to the union from the others with no technical support.

Type 2: Traditional pig farms: The main characteristics of the traditional units are their small size (less than 4 sows) and the use of waste for feeding. Some of these farmers supplement these scraps with a single commercial feed whatever the physiological stage of the animals. Housing is rudimentary - tethering or penning. The products, weaned piglets or pork, are sold to individuals. Family labour is used, sanitary measures being basic or absent. Two sub-types were identified: the "traditional creole" and the "traditional fattener".

Type 3: Small units undergoing transition: Breeders undergoing transition hope to join the dominant model and have adopted certain of its characteristics, notably the use of specialised breeds. Their herd has fewer than 12 sows, they use family labour, and the products, mainly weaned piglets, are sold to individuals.

Type 4: Innovative pig rearing systems: These medium-sized farms (6-10 sows)

develop alternative systems to the dominant model. The main difference is that the livestock unit is part of a wider range of activities. The objective of the breeding unit is not simply the maximisation of profit. Thus one can find in some of these farms agro-tourism activities or banana production whose residues are recycled by the pigs.

The diversity of the rearing systems analysed reflects an adaptation to all the available niches. The breeders make use of various resources, those of the dominant model their technical capability and technical and financial support, the others the resources of their farm in terms of labour and foodstuffs and their network of acquaintances both as suppliers and as customers.

Discussions with specialised technicians, often instigated informally by all the types of farmer, and 9 additional surveys carried out by students outside the land reform area, have confirmed the existence of these different types of rearing units throughout the whole of the territory (Collectif 2002). However, in view of the fact that the beneficiaries of land reform are by definition farmers, the category of non-farmers fattening 1 or 2 pigs is certainly greatly under-estimated in the observations, as perhaps it was also in the Agriculture Census. In conclusion, the great majority (more than 90%) of the pig-breeding units in Guadeloupe do not belong to the dominant model. The lack of official support in an economy where the informal is so significant means that the units tend to develop without reference to the existing regulatory framework.

THEORETICAL FRAMEWORK FOR THE ANALYSIS: THE INFORMAL ECONOMY

The theoretical field of the informal economy appears pertinent for analysing the question of the relationship of an economic activity with regulation. In effect, whatever you care to call it (underground, second, parallel, invisible, black etc.) the notion of an informal or unofficial economy is often closely connected with the question of legality. This is the view taken by Archambault and Greffe (1984) who distinguish within the unofficial economy illegal activities and undeclared legal activities. As one needs a theoretical framework to understand the reality in order to react to it, that of Archambault and Greffe would not appear to be very applicable to Guadeloupean agriculture, in which the very size of the unofficial activity seems to confer on it social legitimacy. There are no customary rights in Guadeloupe and Martinique - the Amerindian societies having disappeared with colonisation. The concept of a rule proposed by Philippe Hugon (1984) brings into the analysis the notions of power and of battle of wills: "whether an activity is official or not depends on the rules, the social structures and the relationships with authority which are peculiar to each society". Usunier and Verna (1994) make a similar distinction between legality and legitimacy although they reserve the term "informal" for actions which are illegal but legitimate. The rule is defined as that which is accepted as normal and legitimate by society.

According to Hugon, depending on the case, an individual may be in the official economy, the alegal (or tolerated) economy,

the irregular economy, or the illegal economy (Fig.2).

As for any enterprise, the criteria chosen might be the declaration to the tax department or welfare organisations. The approach chosen in this study is quite different and more technical. From a development point of view, we have to consider observance of the regulations which apply only to pig farms, which can be in the informal zone even though they may be part of "declared" enterprises.

LEGISLATION GOVERNING PORK PRODUCTION

Pork production in the French overseas departments is completely subject to French national legislation (Direction des Journaux Officiels 2002a; Direction des Journaux Officiels 2002b) although certain clauses can be determined at the departmental level by a prefectural order. However the member states of the European Union are bound to observe the community legislation (European Communities 2002). In the empirical approach chosen, the application of the law will be studied for the main basic stages of the production process for which we know that conformity with standards will require significant effort.

Setting up the Unit

Setting up a piggery generally requires an operator's licence, planning permission and registration.

The operator's licence is concerned with the serious nuisances associated with intensive livestock farming: smells, noise, flies and polluting effluents. In France there

are regulations aimed at reducing these nuisances from piggeries. These rules govern the siting of premises (minimum distance from habitations and water-courses) and management of the units and their operation. Their severity increases with the size of the unit. Large installations (more than 50 animal-equivalents) are subject to the law of 19 July, 1976 which applies to units "classified for the protection of the environment". The creation of the largest units (more than 450 animal-equivalents) requires a prefectural authorisation issued after a public enquiry procedure. For units of 50-450 animal-equivalents, which must be declared to the authorities, farmers send a detailed file to the prefecture showing how they will observe the standards. Farmers with fewer than 50 animal-equivalents are only obliged to follow the departmental sanitary regulations established by prefectural decree in 1984 in Guadeloupe, for whose application mayors are responsible. However, for any erection or extension of a building for livestock, with the exception of a "family-type" unit, the owner must lodge a standard file with the mayor, listing health services and equipment.

A request for planning permission, when this is necessary, has to conform to town planning regulations. Since 1969, anyone who keeps or raises a pig for purposes other than strictly home consumption must declare it to the departmental livestock institution which issues one or more stock numbers.

Animal Husbandry Operation

Management of effluents: As soon as the pig unit is set up, the farmer is bound to control

nuisances, particularly by his cleaning methods, storage and disposal of excrement.

Identification, registration and movement of animals: Since at least 1980, "every owner or keeper of animals of the pig family is bound to ensure that each of them can be identified by indelibly marking it with a herd number, at the latest when it leaves the farm for slaughter". In fact, unlike cows, pigs do not need to be identifiable as long as they remain on the farm. Reproductive animals, sows and boars, carry an individual national identification number. Apart from home consumption, the farmer must keep a breeding register, an official document. He must also keep a health inventory from which he sends an extract to the veterinary services every year. Only marked animals may be introduced into the unit; every introduction must be declared to the veterinary services; reproductive animals may only be moved between farms officially declared disease-free. The marking of animals for sale has several objectives: technical monitoring of the herd, recording the health of the animals and in particular controlling contagious diseases, monitoring of performance with a view to genetic improvement, use of quality labels within the industry, management of financial aid, taxation, and traceability in the context of food safety.

Feeding animals on swill: Since its domestication, the pig has been used as a means of recycling waste (Gade 2000). Household waste still constitutes a significant part of the traditional pig diet

throughout the world. The term swill is mostly used to describe kitchen waste from hotels, restaurants, the farmer's own house or that of people caring for animals or else from industries using meat for human consumption.

In Guadeloupe, this food resource has always been important. In the seventies, nearly every kitchen still had a bucket for "manger cochon" (pig food) to use the creole expression. Not every household possessed a pig, but they could give the swill to a neighbouring pig-owner in return for a good prospect of receiving some of the meat or black pudding to come. Certain pig-breeders thus had a regular circuit for collecting swill. In the sixties, the development of institutional catering, school canteens, hospitals and tourism significantly increased the availability of this food resource. However, this type of food is not only used in traditional pig-keeping. Although it is difficult to establish the type of pig enterprise which used the waste from the institutional catering sector by the end of the seventies in Martinique (Honoré and Jambou 1977), it is certain that swill was one of the basic factors in the development of industrial pig-rearing in Brittany, the leading region for the French pig industry (Le Du 2000). Moreover many industrial pig farms were still using swill at the end of the nineties in many member states of the EU and in the USA.

However pork waste, or charcuterie products eaten by pigs, can be vectors of many of the infectious diseases of pigs, especially swine fever and foot-and-mouth disease. Hence, EU legislation has until now permitted the use of swill only under strict

conditions (sterilisation etc.) and totally forbids the use of swill arising from international transportation. In fact, a proposal to ban its use completely is being discussed in the European Parliament since the foot-and-mouth epidemic of 2001. French national legislation is more restrictive: since 1985 "the use of swill and kitchen waste for feeding pigs and domestic carnivores is positively forbidden" except for prefectural dispensations.

From Production to Consumption: Slaughter Butchering and Sale

Two cases may be distinguished: home consumption and delivery to third parties, with or without payment. "No animal for meat may be slaughtered outside an abattoir except [...] when a person practices the slaughter of goats, sheep and pigs that he has reared or kept and of which the entirety is reserved for consumption by his family" (1971). The person is thus not required to have any status other than having reared the animal. There must not be any distribution of meat or animal products, either free or for payment, outside the family. Hygiene conditions are not regulated as this is assumed to be covered by the fact that the meat is suitably prepared for the family meal.

Beyond strictly home consumption, the farmer falls within the scope of legislation applicable to animal foodstuffs or products of animal origin destined for delivery to the public for consumption, i.e. direct delivery. For this there must be a butchery fulfilling minimum conditions for premises: equipment, water supply, staff, quality of the product and other ingredients used, and

handling and treatment of waste products. It is sufficient to make a declaration to the veterinary services. There is no requirement for any professional competence, but the activity must be declared in the business register. From the abattoir to the supply to the consumer the meat must remain below 4°C. On-farm catering using the farm's produce is also covered in this legislation.

Animal Welfare

All the operations relating to animals, whether for home consumption or not, must observe the rules of animal welfare.

PIG REARING PRACTICES BETWEEN THE LAW AND THE RULE

Since they have to be treated similarly in relation to the rules and to the laws, farms which do not belong to the dominant model have been grouped under the title "small and medium-sized units" (SMUs).

Setting Up the Unit

In Guadeloupe, piggeries of the dominant model, which have to be environmentally classified units, generally follow the procedure to obtain the operator's licence, if only because this determines their access to credit, which is essential for these very costly projects. On the other hand, for smaller units which come under the authority of departmental health regulations, it seems that there have been no cases of declaration to the administrative services concerned. The health authority refers to this document mainly in the case of complaints by neighbours (between 50 and 100 per year).

It is symptomatic that these regulations are never mentioned by most of the farmers or indeed the advisors, even though the latter are aware of the rules about distances between pig units and human dwellings.

The situation is similar in relation to planning permission. As the great majority of piggeries are not environmentally classified, they are built without any official procedure. In view of the small size of the herds concerned, the buildings and equipment can be financed from the farmer's own pocket. One should not be surprised about this when one considers the large number of houses built without permission.

All the pig farms practising technical management of sow herds ("gestion technique des troupeaux de truies" or "GTTT") belong to, or are joining, the union for which this practice is a condition of acceptance. Only these piggeries are licensed.

Registration and Movement of Animals

The ID marking of pigs recommenced in Guadeloupe in 2000 after a halt due to collapse of the professional organisations in the industry. Only the members of the union satisfy the rules for keeping registers and identification of breeding animals needed for GTTT. The other units of the DM are just as much on the margins of the law as are the SMUs in this respect.

The legal requirements covering movement of animals are never observed. In fact the absence of sanctions for this, in particular the fact, that the departmental abattoir never turns away unmarked pigs, authorises this situation.

Management of Effluents

The pig farms surveyed had a variety of housing methods (tethering, pens, stalls or semi-free range husbandry) with different kinds of soils (concrete over soil or compacted soil). Only two pig-keepers out of the 29 surveyed thoroughly treated the effluent: one belonging to the dominant model, with a slurry pit which is cleaned out regularly and the making of manure which is given to a farmer; and one SMU regularly producing manure. According to the technicians, examples of complete treatment of effluent are exceptional throughout the territory, including DMs. In the SMUs surveyed there was generally no treatment of the effluent. There was even a case of manure being made from litter and not used.

This situation would therefore represent the rule for SMUs. However this rule is certainly the one which is changing most quickly as housing conditions and the general way of life change. According to the health authority, there is a growing number of complaints in Guadeloupe, at least officially, about nuisance from livestock holdings. One must wonder, therefore, whether the absence of management of effluents by the large piggeries will continue to be accepted by the population, and whether these piggeries will soon find themselves part of the illegal economy (Figure 3).

In the absence of a diagnosis, the question of environmental impact can only be treated in terms of possible risks. From this point of view, it is clear that there is a serious risk of pollution from intensive pig farms with a high animal density. Bringing

these farms up to standard, thus, constitutes a priority for the Guadeloupe Pig Breeders' Union. Experts consider that there is no need to worry about the SMUs if they are widely separated, the "spatial dilution" eliminating any possible pollution (Cabidoche *et al.* 2001). As to the large piggeries which use non-industrial techniques (tethering, semi-free range husbandry, varied feedstuffs, etc.), a diagnosis is needed. In general, the definition of norms appropriate to non intensive pig units goes hand in hand with the design of suitable equipment.

Use of Swill

The use of swill has never been part of the advisory package offered to pig breeders in Guadeloupe, even before it was banned in 1985. This practice is therefore non-existent in piggeries of the dominant model.

Half (15) of the 29 farmers surveyed use swill. At least four of them get it from institutions or restaurants. In recent years there has been a growing observance of the regulations on the part of institutions. On the other hand, it is not certain that the pig breeders understand the nature of the risks incurred and the efficacy of sterilisation of this material, including the swill of domestic origin. There is no sign in Guadeloupe of requests to the veterinary services for a derogation to use swill, unlike in La Réunion, another French overseas territory, for which, in 2001, fraudulent use was also recorded (Lazarre and Ferrère 2001).

*Slaughtering Practices,
Butchering and Sale*

Whatever their size and specialities, all the farms surveyed have a commercial outlet, like all the pig breeders in Guadeloupe. It seems that, until the sixties, the products from the pig fattened by a family were not usually sold. The family kept most of them, mainly by salting the meat. The rest was given to the family circle, sometimes for barter. A return in cash has become the main aim of this domestic fattening, probably during the seventies. There is now no slaughtering without sale. All the pigs must therefore be killed at the abattoir. From this point of view, the SMUs are off in the illegal zone since, even when the main outlet is the sale of weaned piglets, there is always some sale of meat. However, certain breeders always use the abattoir, although not necessarily out of a wish to respect the law.

The DM units have to use the abattoir. One should note, however, the existence of "deviant" units on some of these farms. Either the farmers concerned rear several pigs in a different way, sometimes even of a creole race, for home consumption, or else they may sell the meat directly to top up their funds and their income, which means they are breaking the law.

Apart from a few exceptions, these farms selling meat directly do not have proper butchering facilities.

RULE OFTEN CONFLICTING WITH THE LAW

At present, there appears to be no activity in pork production which is illegal, strictly speaking, i.e. which contravenes both the

law and the rule, as in the case of the massive thieving which applies to goats. However, if you count the number of piggeries and the number of breeding sows, it seems that most of the pig production takes place in contravention of the law whilst being in accord with the rule. There are different ways of explaining the fact that all the SMUs are part of the informal economy. Originally devoted to home consumption and as a way of making use of left-overs, the piggery is often only an extension of the domestic sphere not subject to legislation. Often the units of medium size are the result of progressive growth of the herd and the pens, the only external limitation being complaints from the neighbours, which are rarely pursued by a formal notice from the mayors. It is not certain that the form of conformation offered to the SMU breeder is compatible with the operation of this type of unit in terms of technical level, investment and objectives. But even if it is, the SMU breeder has no financial interest in making his piggery conform to the norms because in any case public support is reserved for units of the dominant model. On the other hand, the use of food waste and direct sale of the products significantly increases the revenue of the farm. Thus the SMUs tend to be in the informal economy but not necessarily intentionally beyond the law.

As far as the DM units are concerned, we can assume that it is the need to obtain credit and to have a management programme which leads them to observe the legislation for creating the unit and the identification procedures. In fact, the desire to conform with, or to flout, the technical

legislation does not explain the farmer's behaviour, as it might in the case of fiscal legislation. It is, therefore, important to note that the activities recorded as *alegal* are mostly classifiable as passive illegality rather than active illegality.

The fact that the social rules should be so much in conflict with the laws is noteworthy. In fact, examination of the regulatory arrangements in France shows that the law did not arise spontaneously. It is a social construction resulting from negotiations, reflecting history and representing a system of values and an economy. The difference between the rule and the law is therefore mainly from the fact that the production system and local culture are far removed from those of mainland France. One of the causes of this divergence is clearly historic. The post-slavery plantation economy, which was dominant until the fifties, was one of under-employment in which rural workers were forced to produce part of their food requirements for themselves and to combine several economic activities. No productive specialisation was possible for small producers and the weak social division of labour and the survival culture characteristic of the time are still, to some extent, with us today (Zébus 1999).

In many respects, the legal arrangements described above are not really activated: they are not publicised, and clearly there is no control and no sanction. It seems that, in such cases, there is no effort on the part of the responsible institutions to apply the law. This could be explained by the exotic nature of the legal framework, making any attempt to rapidly apply norms too costly

materially, socially and politically. In certain cases, this opposition to change is reinforced by the attitude of depreciating the SMUs or of denying their existence. In any case, this absence of policy somehow legitimises the deviant behaviour of both producers and consumers. From this point of view, in certain cases the institutions charged with the application of the law contribute to the maintenance of a rule which is in conflict with the law. Omissions such as the absence of a definition of "family-type pig-keeping units" in the departmental health regulations, a legal document, illustrate this undeniable fact. The presence of politicians on the departmental committee which presided over their drafting is certainly not irrelevant in this regard.

ROUTES FOR DEVELOPMENT

The considerable dynamism with which small and medium breeders have developed and modernised certain of their practices, such as feeding and sanitation, without direct assistance, is noteworthy. This leads one to wonder whether it would be preferable to integrate them into a development policy instead of continuing with the "laissez-faire" approach.

One is tempted to express the problem another way: why should some of the producers receive no support? The small and medium breeders (SMUs) have advantages in terms of maintenance of biodiversity, and maintenance of rural employment and rural life (Zébus *et al.* 2001). Their socio-economic importance is undeniable, both in terms of their contribution to local production or as numbers of farms. It is perhaps among these

farms that one might find the biggest scope for improvement. Although it appears that the farms of the dominant model are, at present, best suited to respond to the demands of wide scale distribution and of institutional catering, it would be, to say the least, risky to build an industry on a single model when one realises how dependent this production model is on farm supply industries and also on the marketing system. Furthermore, there does not appear to be any competition between the dominant model and the others. On the contrary, phenomena such as the purchase of weaned piglets by SMUs from DM units tend to be complementary. All this suggests that a diversity of production systems should be considered as advantageous in itself for the pig industry (Zébus *et al.* 2001) and for cattle production (Salas 1989). This diversity is one of the ways of preparing for the possible emergence of completely new and unpredictable phenomena such as the BSE crisis or the collapse of pork consumption in the countries of the former Soviet bloc. Such uncertainties are a feature of our complex socio-technical systems (Le Moigne 1990).

Another way of responding to this question is to consider the potential threats for this type of livestock breeding. The rule is strongly conditioned by the demand. Hence, the authors have already underlined the extra confidence which the SMUs receive from consumers who want "natural" food; not only confidence in the producer but out of respect for tradition (Zébus *et al.* 2001). But the *laissez-faire* involved is risky, partly because the rule may evolve: (i) the population increasingly demands high

standards of living, and the neighbours will soon refuse to tolerate the nuisance from the piggeries, (ii) pressure from environmental groups will make it difficult to continue without proper arrangements for recycling effluents, (iii) the desire of the administration to make sure that the regulations are progressively extended to cover the smallest piggeries, (iv) the clients of these producers might eventually expect quality standards (hygiene, traceability etc.) which, in theory, are not satisfied by this type of production, (v) the occurrence of a sanitary accident which would disqualify this type of pig units or even all pig production should not be dismissed, (vi) the current preference for the local meat is not immutable.

What is needed, therefore, is a positive development policy for the different pig rearing systems: and, considering the importance of the regulations governing pig breeding, one should consider the question of bringing the various kinds of piggery up to standard whilst ensuring that this upgrading is not another factor tending to weaken the SMUs.

The factors underlying the legislation governing livestock rearing in France and Europe are such that it is difficult to obtain derogations when they are not envisaged in the law. It should be noted, however, that unless the local production is intended for export, considering the relatively high cost of production and the rate of self-sufficiency (65% - 70%), the industry should escape the most restrictive legal dispositions.

It is also a matter of considering the scientific and technical relevance of the legislation for a country like Guadeloupe,

that is to say the real health and environmental risks associated with pig rearing. The need to develop environmental standards appropriate for a tropical island environment has already been mentioned. In the field of animal health, there has been no reported case of a disease known to be contagious for ruminants or pigs and the insularity allows complete sanitary isolation by means of effective controls at the frontiers. But there is no systematic search for diseases in the animal population. Hence the veterinary services are awaiting the end of an epidemiological diagnosis currently being undertaken in the territory to define the priorities and the means for a sanitary policy. The pace of application of legislation will depend on the gravity of the situation (Mavoungou 2000; Scoizec 2002). The problem of food safety would have to be treated in a different way.

The analysis presented illustrates several principles for official action. Regulatory pressure is increasing and will become greater for SMUs whose identification, for example, is on the agenda. It would be a pity and certainly futile to begin to take an interest in these farms simply to bring them into line. The first step is therefore to recognise them, at least certain types of them, as targets for development. This implies new demands on research, development and training institutions, an analysis of current practices, suggestions for alternative development models to the dominant model, and standards appropriate to the biophysical and socio-economic environment, the introduction of a differentiated training policy (techniques,

finance, organisation) (Bory and Paul 1991; Capillon and Sebillotte 1980; Fabri and Paul 1990). A policy of standardisation will, moreover, have more chance of success if its implementation is based on realistic objectives rather than the progressive and somewhat incomplete application of objectives which are out of reach. Also, although the intention behind the law may be justified, the method of implementing it is not necessarily appropriate and from this point of view one should perhaps learn from the experience of certain countries which recently joined the European Union and even neighbouring developing countries. Furthermore, it would be advisable to take advantage of new initiatives in the community and national agricultural policy such as "multi-functionality" of agriculture, respect for the environment, quality and safety of food, territorial policy, differentiation of interventions according to the type of farming, to keep an eye on these "non-standard" breeders so as to ensure that other breeders who are entitled to financial, technical and organisational assistance are once more its main beneficiaries. Generally speaking, the problem of competitiveness of local production should be studied in all its aspects: the basis of the preferences of local consumers, the price system, the nature and the durability of objective differences between this meat and fresh imported meat etc.

Finally, it is essential that interventions should vary according to the type of rearing system, i.e. according to its aims, its place in the farmer's activities, and the technical options. For example, certain small breeders

only take advice provided that doesn't mean spending too much additional resources. Some would rather give up their pig unit rather than transform them, given the low cost of SMU units. Possibilities for development will not be the same if the pigs are for home consumption, making use of waste and/or profit. Clearly one should not overlook the case of breeders wanting by all means to avoid taxation.

This way one can begin to consider the problem of direct sale of meat by SMUs. There being no official quality labels to distinguish the SMU meat from that of the DM, this method of sale is the one which in principle will add most value to the production of the fatteners and breeder-fatteners. One would expect that most of these producers would make use of the abattoir; some are already doing so. On the other hand, a registered butchery could probably not be profitable for most of these pig farms. Yet a mobile butcher, either co-operative or private, which moved from farm to farm on market days, could be envisaged. As to the treatment of effluents, apart from the definition of standards applicable to a tropical environment, farms not belonging to the DM should be offered suitable nuisance management techniques. Moreover, one should note the low usage of effluent for fertilising crops in our sample, which is surprising, for example, for market gardeners. The fact that the demand for manure in Guadeloupe is reckoned to be large (Cabidoche *et al.* 2001) suggests that there is a problem matching the supply to the demand: a supply of slurry but a demand for

manure, the wrong balance of amounts, absence of suitable transport and of knowledge of the use of this type of animal manure. The question of recycling effluents is therefore multidimensional.

In conclusion, there is a big difference between current practices in pig husbandry units and a more and more stringent regulation. But the question of respect for norms is indissociable from that of the definition of new research, training and development policies which take account of the diversity of situations and of functions in pig breeding and in agriculture in general. By an apparent paradox, the legal and political context has never been so favourable to this challenge. The law for the redirection of agriculture passed in France in 1999 provides the framework for alternative forms of development. Furthermore, the status of the French overseas departments as extra-peripheral regions allows them to exploit their differences. However, the search for technical and organisational solutions will benefit by drawing on the experiences of developing countries and particularly Caribbean countries for which the problem of meeting standards is especially crucial if they export and because they are close to the USA, which wants to protect its herd from all forms of contamination.

Figure 1 : The Size of Pig units in Guadeloupe (SCEES 2001)

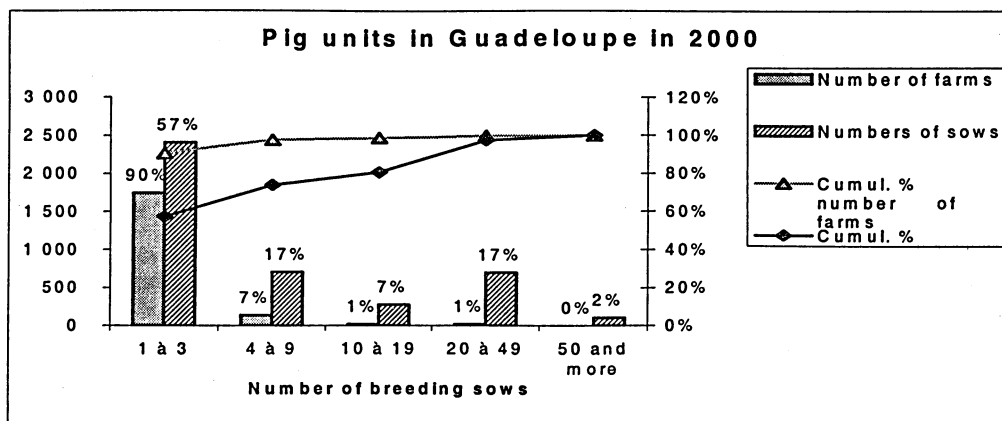


Figure 2: Classification of Economic Activities (adapted from Hugon 1984; Usunier and Verna 1994)

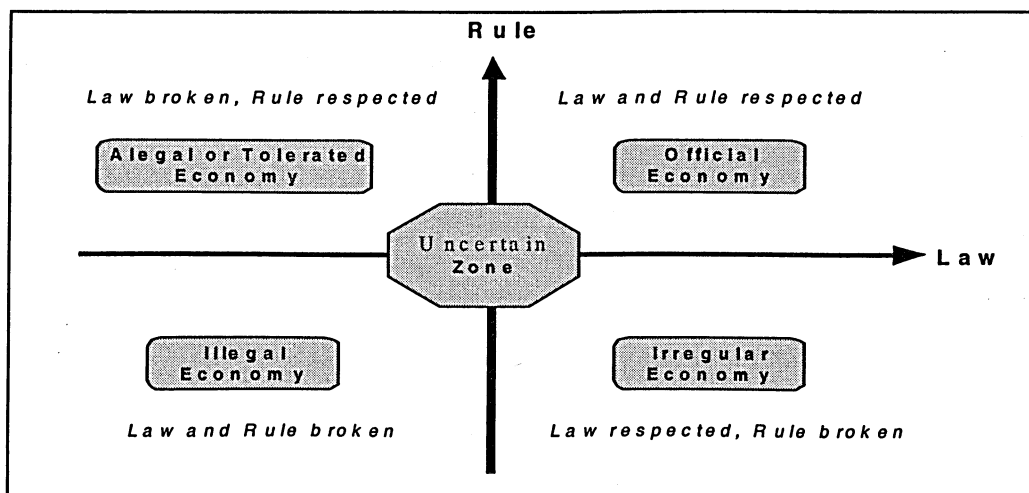
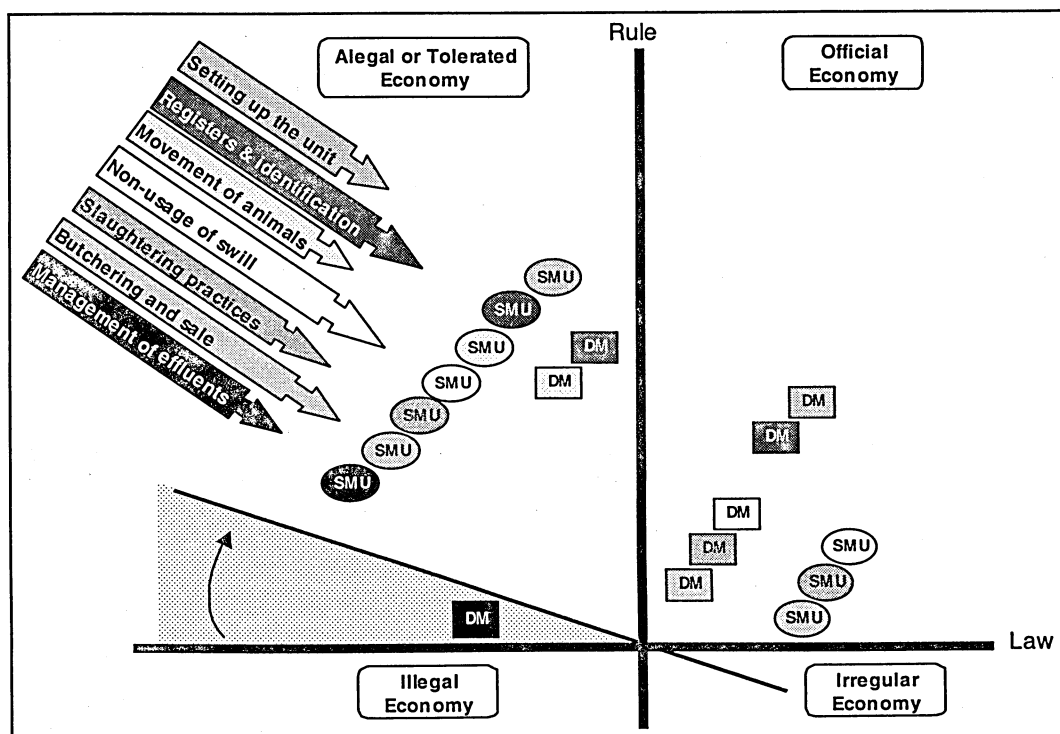


Figure 3: Respect for the law and the rule in pig farming in Guadeloupe



References

- Archambault, É., and Greffe, X. (1984). "Presentation." In É. Archambault and X. Greffe, (eds.), *Les économies non officielles*, Éditions La Découverte, Paris (France), 5-45.
- Bory, A., and Paul, J.L. (1991). "Réflexion sur les synergies possibles entre la recherche-développement et la recherche agronomique classique." *Bulletin Agronomique Antilles-Guyane*, n° special (Quelle recherche? Pour quel développement?), 24-38.
- Cabidoche, Y.M., Dorel, M., Paillat, J.M., and Robin, P. (2001). *Inventaire des données scientifiques et techniques disponibles dans les DOM insulaires, relatives à la fertilisation azotée des cultures, à l'*

leur conduite, au fonctionnement des aquifères et aux phénomènes de transfert d'azote dans le milieu et à leur incidence. Proposition de recherches complémentaires pour valider les outils de fertilisation raisonnée et tester leur impact sur des bassins représentatifs (Expertise demandée par le Ministère de l'Aménagement du Territoire et de l'Environnement, Direction de l'Eau), INRA, Petit-Bourg (France), 68.

- Capillon, A., and Sebillotte, M. (1980). "Étude des systèmes de production des exploitations agricoles. Une typologie." In J. Servant and A. Pinchinat, (eds). *Caribbean Seminar on Farming*

- Systems Research, INRA, IICA, Gosier (Guadeloupe, France), 85-111.
- Collectif. (2002). *Diversité des stratégies d'alimentation dans les élevages porcins en Guadeloupe. Rapport d'enquêtes*, Université des Antilles et de la Guyane, Département d'Agronomie Tropicale, Maîtrise des Sciences et Techniques "Sciences agronomiques et développement rural", Pointe-à-Pitre (Guadeloupe, France), n.p.
- Direction des Journaux Officiels. (2002a). "Code rural [on line]." Retrieved April 2002 from http://www.legifrance.gouv.fr/html/frame_jo.html, Paris (France).
- Direction des Journaux Officiels. (2002b). "Légifrance. Journal Officiel [on line]." Retrieved April, 2002, from http://www.legifrance.gouv.fr/html/frame_jo.html, Paris (France).
- European Communities. (2002). "Eur-Lex. The portal to European Union law [on line]." Retrieved April, 2002, from <http://europa.eu.int/eur-lex/en/index.html>.
- Fabri, C., and Paul, J.L. (1990). *Irrigation et réforme foncière, une nouvelle donne. Nécessité d'une nouvelle approche du développement agricole*. Magistère DAC, Université des Antilles et de la Guyane, ARECA, Pointe-à-Pitre (France), 29.
- Gade, D.W. (2000). "Hogs." In K.F. Kiple and K.C. Omelas, (eds.), *The Cambridge World History of Food*. Retrieved May 2002 from <http://us.cambridge.org/Books/kiple/hogs.htm>.
- Honoré, J.C., and Jambou, M. (1977). "Utilisation des eaux grasses par les porcs." *Nouvelles Agronomiques Antilles-Guyane*, 3(3-4), 338-343.
- Hugon, P. (1984). "L'économie non officielle : modes de vie et de survie dans les villes africaines." In É. Archambault and X. Greffe, (eds.), *Les économies non officielles*, Éditions La Découverte, Paris (France), 197-209.
- Lazarre, G., and Ferrère, J. (2001). "Les eaux grasses condamnées par la fièvre aphteuse. Une note des services vétérinaires interdit la récupération des eaux grasses dans les cantines." *Le Journal de l'île* [on line], Saint-Denis (La Réunion, France), Retrieved April, 2002, from www.clicanoo.com/articles/article.asp?id=9818.
- Le Du, D. (2000). "Production porcine. 1960-1990 : la grande mutation." *Paysan breton, Dossier* 08/09/2000, 3.
- Le Moigne, J.L. (1990). *La modélisation des systèmes complexes*. Dunod, Paris (France).
- Mavoungou, J.P. (2000). *Etude de la pathologie porcine en élevage traditionnel à la Guadeloupe*, DESS "Productions animales en régions chaudes", CNEARC, Montpellier (France), 60.
- Salas, M. (1989). *Systèmes d'élevage bovin allaitant en Guadeloupe, diagnostic et voies de développement*, Thèse de Doctorat, Université Paris XII, Paris (France), 348.
- SCEES. (2001). "Recensement Agricole 2000. L'Essentiel. Départements d'outre-mer." Ministère de l'Agriculture et de la Pêche, Paris (France).
- Scoizec, A. (2002). *Etude épidémiologique des maladies des porcs en Guadeloupe (F.W.I.)*, Thèse de Docteur Vétérinaire, Ecole Nationale Vétérinaire, Nantes (France), 184.
- Usunier, J.C., and Vema, G. (1994). "Légalité ou légitimité? (Chapitre 6)." In J.C. Usunier and G. Vema, (eds.), *La grande triche (Corruption, éthique et affaires internationales)*, Éditions La Découverte, Paris (France).
- Zébus, M.F. (1999). "Paysannerie et économie de plantation. Le cas de la Guadeloupe (FWI.) 1848-1980." *Ruralia* (5), 23.
- Zébus, M.F., Diman, J.L., Deshalette, S., and Alexandre, G. (2001). "La diversité de l'élevage porcin guadeloupéen, une richesse méconnue." Paper read at CARREN 2001, Valorisation des ressources naturelles renouvelables dans l'arc caraïbe insulaire au XXI^e siècle, Région Guadeloupe; Parc National de la Guadeloupe, at Lamentin (Guadeloupe, France), 3-7/12/01, 13.