

**SPECIFIC BIOSECURITY ELEMENTS OF PIG FARMS**

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**Abstract**

*The study aims to establish how to ensure biosafety in farming and fattening of pork, as well as the measures taken to comply with the rules for the protection and welfare of animals.*

*The present paper presents aspects of preventing the introduction and spread of pathogens in the animal farm, and monitoring of climate, all of which reported to the current legislation, in the context of the resumption of exports of meat and meat products of the intra-Community market.*

Keywords: biosecurity, animal pathology, disinfection, legislation, animal welfare, veterinary control.

**1. INTRODUCTION**

Biosafety is a modern concept, but management, scientific and technical, but especially important in practical terms in the current era of pork. Through biosecurity measures from the farmer understand organisational and technical, to be applied in a farm to prevent the introduction of diseases, persistence and spread of pathogens, so be prevented the emergence of communicable diseases with high degree of contagiousness. [3] Biosafety is a guarantee of quality of the livestock production and in particular a guarantee of wholesomeness of the foodstuffs of animal origin and the protection of public health from zoonotic pathogens transmissible to man (over 150 species of viruses, prions, bacteria, fungi). For farmers is important especially to ensure biological productive potential expression of breeds, increasing production and profit. Ignoring biosecurity measures is usually followed by increased production costs as a result of subproductivității and of combating the disease.

The economic aspect is just as important for the national economy, since livestock production not only provides essential nutrition for humans, but is also the Foundation for a host of other industries that provide jobs and contribute to the general increase in the level of life. [9]

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essential nutrition for humans, but is also the foundation for a host of other industries that provide jobs and contribute to the general increase in the level of life. Success in the control of infectious diseases is to break the cycle of infection and transmission, which is the result of combined bio-security measures, vaccination and disinfection, insect combat programs and protection against pests, which must be properly applied in raising pigs.

Assessments in all systems of raising pigs, have demonstrated that biosafety is the cheapest way of controlling livestock diseases in different systems. For the first time since joining the European Union, Romania is authorized to market and to export pork on the intra-Community market and in third countries, as a result of the fact that demonstrated that classical swine fever may curb the development through careful monitoring of all risk factors.

The decision was taken at a meeting of the Standing Committee for the food chain and animal health which took place in Brussels on 6.12.2011.

In this context, the participation of Romania with meat and pig meat products in intra-Community trade and exports to third countries, it will be after the publication of the decision in the official journal.

Secure channel for intra-Community trade involves the establishment of a network of farms, slaughterhouses and secure units that meet all the requirements of biosecurity and traceability, from which can be pork sold in the European market and outside.

Protecting swine population of contamination with undesirable microorganisms is a very important component of industrial production.

The introduction of a contagious pathogen microorganism in swine herds could cause serious economic consequences. Infecting livestock with diseases is very expensive and is one of the most important factors contributing to limiting the genetic potential of the animals.

In addition to the productive and financial benefits, diseases preventing and contributes to animal welfare.

The health of farm animals and their welfare requires a certain minimal biological comfort, without which it is not possible to express the full vitality and genetic performance of breeds and hybrids. [9]

This means ensuring the vital space is essential, daily supervision of all animals, computerized monitoring of microclimate, ventilation, food consumption, and water and the application of disease prevention programs.

The Universal Declaration on animal welfare, developed by the World Society for the protection of animals, defines the welfare through the degree to which the requirements are met, the physical and psychological behavior of the animal.

In the same statement, in relation to animals dependent on humans, the five principles, this must be carried out at the same time: providing access to fresh water and food, ensuring the appropriate environment, including housing and rest, pain, injuries prevention, diagnosis and treatment of disease, the release from fear and suffering, mental space, facilities for expression of normal behavior. [7]

World Veterinary Association admitted the five principles, on the occasion of the General Assembly in Paris (1992), which is considered essential for the well-being and protection of domestic animals. Behavioral changes depending on the comfort offered to express the extent to which technology applied to meet the requirements of the animal in relation to age, physiological state and productive level.

Behavior changes as a result of stressor causing disturbances in production, breeding, with significant economic losses.

The European Commission has adopted a new strategy for four years (2012-2015), which aims to improve further the welfare of animals in the European Union. The new strategy was adopted in the form of a communication from the Commission to the European Parliament, the Council and the European Economic and Social Committee, at 19.01.2012.

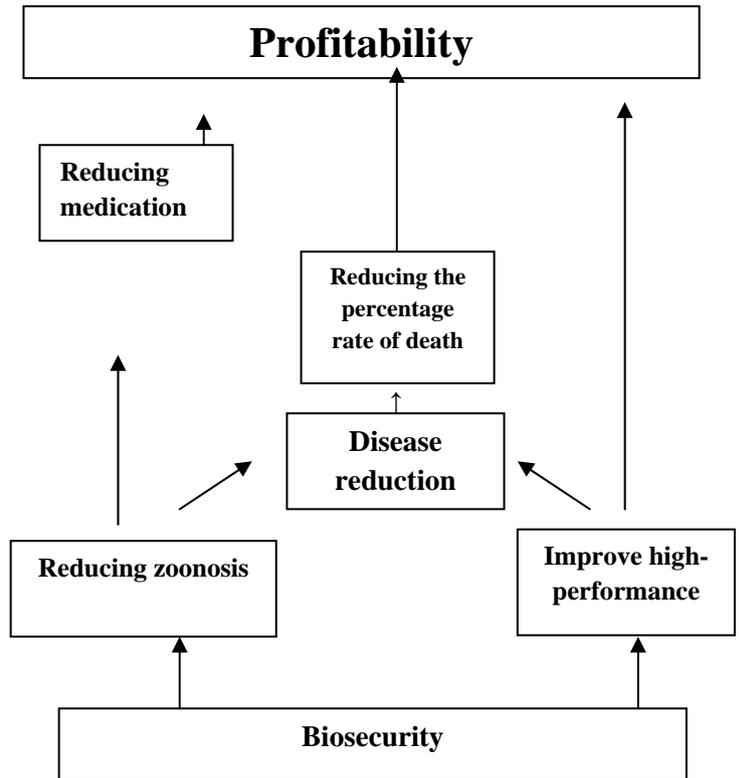
Theme welfare increases in importance, not only in the European Union, but also in the whole world. It is considered to be an opportunity for the improvement of animal production in developed countries and in the developing world, but also a value in international trade. [8]

## **2. MATERIALS AND METHODS RELATING TO BIOSECURITY IN A PIG FARM**

Biosafety is understood as preventing the entry of pathogens in pig farm, but the real bio includes in addition and control of diseases dissemination within the farm. The importance of biosecurity has become increasingly larger, with the continuous change of the epidemiological disease in swine.

Reducing the cost of the disease, the result will be increasing profitability by reducing mortality, improving performance through a better feed conversion and average daily growth, a healthy means a reduction in

direct costs of veterinary care and medication, and indirectly improve the quality of the animal at slaughter. In the Figure 2.1. are presented schematically the advantages of maintaining a high level of biosecurity.



**Fig. 2.1. The link between bio-security and profitability**

**Source: authors**

Control and prevention of disease is essential to an effective profitable and healthy, the most important being the operations: clinical examination, early diagnosis and proper treatment, cleaning and disinfection strictly. Veterinary management ensures the quality of each daily observation, in the event of illness or injury.

If an animal does not eat, or have diarrhea fever, it is important to give a correct diagnosis, to start treatment, and to take measures to prevent the expansion of the disease. In this case, the pigs are isolated and treated separately.

Initially, at popular, treatment against parasites, and the decision should be given veterinarian and other treatments. [6]

Where it was decided a treatment by injection, it will treat the first animals less sick and those showing signs of disease, in order to avoid a fast spread of the disease. Every popular will distribute 1-2 speakers to isolate animals showing dysfunction, where you will be treated and will be more easily monitored. Mortality in pigs subjected to fattening (18-20 kg up to slaughter) is relatively small.

Your death will be harvested from the hall on a daily basis and transported in a container that does not permit the spread of blood, secretions, feces, etc., during

transport to the room specially arranged storage bodies. It will be equipped with cooling systems that will ensure chilling of the bodies until their takeover by the firm of rendering plants or transporting them to an incinerator.

[8]

### Animal Shelters

As a general rule, design and construction of housing must be carried out in accordance with the rules of protection and animal welfare. The material used must be resistant, waterproof, and is not harmful to animals, that they can be easily cleaned and disinfected. The animal must not have sharp edges, sharp edges, heads up, fastening systems, bars or any other objects that can injure the animals. Floors must be smooth but without bumps or breaks that can cause injury. Shelters must be designed so that there is a rest area, dry and clean, with the minimum requirements on the free surface of flooring available for each category of pigs (table 3.1).

**Table 2.1. Minimum requirements on floor area**

The category of pigs	The weight of the average	Minimum area
piglets	< 10 Kg	0,15 m <sup>2</sup>
piglets	10-20 Kg	0,20 m <sup>2</sup>
young pigs	20-30 Kg	0,30 m <sup>2</sup>
fattening pigs	30-50 Kg	0,40 m <sup>2</sup>
fattening pigs	50-85 Kg	0,55 m <sup>2</sup>
fatty pigs	85-110 Kg	0,65 m <sup>2</sup>
fatty pigs	> 110 Kg	1 m <sup>2</sup>
inseminate sows	-	1,64 m <sup>2</sup>
sow	-	2,25 m <sup>2</sup>

Particular importance is given to the microclimate (table 2.2).

The pigs are very sensitive to adverse weather conditions.

For the growth and operation of the pork does not recommend the use of non-insulated shelters. In winter, when the temperature outside is very low, it is impossible that the temperature in the shelter to be maintained at the correct level. [4]

In the summer, solar radiation generates very high indoor temperatures, whereas solar energy which penetrates through the roof is too high.

The accommodation offers the possibility of maintaining microclimate beneficial conditions and with positive influences. Also, allow a microclimate which offers the best conditions for various categories of pigs, offering the best possibilities for production. [9]

The main factors that determine the microclimate in a shelter are:

- speed
- air
- air temperature humidity

The maximum width of the slits, when used sloping floors of cement for a pig reared in a group must have the following dimensions:-11 mm for piglets;

-14 mm for weaners;

-18 mm for youth in;

-20 mm for inseminate sow.

The minimum width of the grate must be 50 mm for piglets and pigs weaned up to 80 mm for rearing pigs, inseminate and brewing sows.

**Tabelul 2.2 Microclimate factors**

Category of animal	Temperature (°C)			Relative humidity (%)		Air speed (m/s)	
	Minimum	Maximum	Optimal	Minimum	Maximum	min temp.	temp. max
male pig	10	24	15	60	70	0,2-0,3	1,0
brewing sow	10	24	15 - 18	60	70	0,2-0,3	1,0
sows in lactation	15	24	18 - 22	60	70	0,2-0,3	1,0
piglets 0-7 days	-	-	32 - 30	60	70	0,2-0,3	1,0
piglets 8-14 days	-	-	30 - 28	60	70	0,2-0,3	1,0
piglets 15-21 days	-	-	28 - 24	60	70	0,2-0,3	1,0
piglets 22-28 zile	-	-	24 - 22	60	70	0,2-0,3	1,0
piglets 29-36 days	-	-	22 - 20	60	70	0,2-0,3	1,0
fattening pigs	15 - 18	24	18 - 24	55	70	0,2-0,3	1,0

Animals must not be kept permanently in darkness, nor be exposed to artificial light without interruption; the light intensity must be at least 40 lux for a minimum period of 8 hours a day. [2]

In summer, the relative humidity will be increased artificially by means of sprayers located on the ceiling. Rest area there must be no air currents.

The volume of air Guide (minimum) shelter needed per animal is:

- Animals must not be kept permanently in darkness, nor be exposed to artificial light without interruption; the light intensity must be at least 40 lux for a minimum period of 8 hours a day.
- In summer, the relative humidity will be increased artificially by means of sprayers located on the ceiling. Rest area there must be no air currents.

The volume of air Guide (minimum) shelter needed per animal is:

- nonbreeding sows..... 6,0 m<sup>3</sup>/head
- brewing and lactation sows..... 21,0 m<sup>3</sup>/ head
- young pigs..... 3,0 m<sup>3</sup>/ head
- fattening pigs..... 3,5 m<sup>3</sup>/ head
- vieri ..... 20,0 m<sup>3</sup>/ head

**3. RESULTS AND DISCUSSION ON THE FARM BIOSECURITY**

In the analyzed company, bio-security rules are implemented in accordance with Government Decision No. 515V/2008 growth and fattening farm of pork with two distinct areas: the administrative household area-(dirty) and production (clean).

- Administrative and range the household represents all the auxiliary buildings: filter, head of health, veterinarian office.
- Production area includes shelters for animals and necropsy act.

In the context of growth and fattening farm of pork, the two areas are separated by a fence which has a height of 1.80 meters, as there are able to pass from the administrative household in the area of production than using the gateway.

The farm is bordered by a fence made of wire mesh with a height of 2 meters, along which are columns with lamps placed to ensure an efficient lighting during the night.

The company has a contract with a security company which provides specialized guarding only at night. Access to the ranch and fattening is made only on the gateway, with some specific procedures.

Sanitary filter has the exterior dimensions: 8,70 x 14,82 m, a level, having isolated foundations and reinforced concrete beams in reinforced concrete.

Access to the farm can be done only through the plumbing (fig. 3.3), located next to the field kitchen.

The construction has a high P, with steel structure and the external walls of the sandwich with the thickness of 8 cm.

Internal subdivision is made of sandwich walls 5 cm and divides the two areas:

- health technological area, which includes: Head Office, veterinarian Office, control room, living room, storeroom, WC;
- sanitary filter area, which includes: the locker room undressing, shower, locker room equipment, lounge, laundry equipment;



**Fig. 3.1. Sanitary filter area**

Source: authors

Sanitary veterinary supervision shall be carried out under the national program for the surveillance, control and eradication of animal diseases approved by decision No

2010V/712VEU and co-financed by the European Commission, the classical swine fever is monitored in commercial farms veterinary approved by:

**I. Clinical Supervision**

1. Daily-the owner of the animal;
2. Weekly-free practice veterinarian responsible for the holding, the information is recorded in the register of consultations and treatments;
3. monthly-the official veterinarian, shall draw up a card in which are recorded and archived.

**II. The supervision period, 1% per year, randomized, all healthy pigs, planned on a monthly basis**

**III. Virusologic surveillance:**

1. take 10 samples of organs and stern/monthly sick pigs with clinical signs who died and who had lesions typical of classical swine fever;
  2. blood is collected on EDTA for PCR from pigs sick with fever and clinical signs of classical swine fever. [6]
- The analysis bulletins issued by the laboratory animal health and food safety, that People were sent for to perform laboratory testing of samples recorded in table 3.1.

**Table 3.1. Samples for laboratory examinations for the surveillance of PPC**

Year	Serological surveillance (samples no.)	Virusologic surveillance (samples no.)		
		born stern	set organs	Blood EDTA
2009	15	2	2	-
2010	51	11	11	5
2011	39	47	5	5
2012	58	4	4	5

**4. CONCLUSIONS**

Biosecurity measures exercise utility function in a farm, the work is very varied. Collection and neutralization of bodies shall be made in accordance with the specific legislation in this field. The activity of the pigs can create local discomfort due to the smell. Odors occur and when they are referring to scattered on the ground. to do this, it is necessary on the ground scatter droppings management to reduce unnecessary inconvenience caused by smell, by:

-the spreading during the day, when it is likely that the population will not be home and week breaks and holidays;

-observing the direction of the wind in relation to the houses in the village.

It also calls for the construction of pool storage of slurry (lagoon), water-repellent with a layer of compact clay and a special geomembrane and with a capacity of 3000 m3. [11] The catchment area will be covered with a tarpaulin.

In this way, the slurry is considered waste, after it stabilizes (ferments) constitute a valuable î for soil organic fertilization.

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