

TECHNICAL ECONOMICAL EFFECTS OF THE MEASURES ON THE PIGS WELFARE AND PROTECTION

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Abstract

The term of animal welfare was chosen to describe the animal life quality. It is derived from the English language. This notion includes health, productive comfort and also involves the animal protection. The Universal Declaration on Animal Welfare, issued by the World Society for Animals Protection, defines welfare as: Degree in which the animal physical, behavioural and psychological requirements are met. As a member state, Romania has implemented EU legislation on the animal welfare and protection, including farm animals. There are seven measures to ensure the minimum standards concerning animal welfare on farms and they include: flooring, lighting, fights prevention, potable water, microclimate, dry bedding, health. Increasing the number of farms in which are applied superior measures in comparison with the mandatory technological measures and improving the welfare of pigs leads to improving the environment and the rural space. The animal welfare superior standards often involve additional costs and therefore the state provides some tools to compensate producers for higher production costs for: increasing by at least 10% of available space allocated to each animal, ensuring at least 11 hours / day artificial light with a value of 50 lux of lighting, improving pig welfare conditions during transport, correction the nitrites and nitrates level in the water, reducing pollutants by 30% in comparison with the mandatory minimum level, by maintaining optimal microclimate parameters limits, improving the rest area.

Keywords: *welfare, pigs, holding, protection, microclimate.*

INTRODUCTION

The concept of animal welfare means the animal life quality and derived from English language, which uses the term welfare. This notion includes health, productive comfort and also involves animal protection. The Universal Declaration on Animal Welfare, drafted by World Society for Protection of Animals, defines welfare by: Degree in which physical, behavioural and psychological requirements of the animal are met.

In the same Declaration, are presented the five principles, which must be ensured concomitantly:

- ensuring access to fresh water and specific food;
- ensuring appropriate environment including shelter and rest;
- preventing pain, hurts, diagnosis and treatment of diseases;
- relief of suffering;
- providing space, facilities for expressing normal behaviour.

Animals that live in the same conditions, can pass from one level of welfare to another, depending on physiological requirements and behaviour. Some noises have adverse effects to the health and behaviour (mental stress), by the irritant effects triggered by certain characteristics of intensity and strength of sounds. It may be that against certain excitant environmental stimulus, acting intense and repeated (fans noise or scrapers etc.), the first reaction of animals to be intense and after that getting used to note, accompanied by gradual reduction of the response, up to ignore these stimulus.

The welfare is also influenced by the conditions of feeding, watering, microclimate, and the information flow between animals and their environment. Prolonged isolation in small spaces, closed, without contact with the natural environment and with other animals can lead to stress. For these reasons, even for animals kept in individual boxes is mandatory visual communication and by smell with the animals in the same shelter.

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MATERIAL AND METHOD

The paper studies the technical and economic effects of additional welfare and protection of pigs measures relating to:

- increasing with at least 10% of space allocated to each animal;
- ensuring at least 11 hours / day artificial light with a value of lighting of 50 lux;
- improving the welfare of pigs during transport;
- correct the level of nitrites and nitrates in the water;
- pollutants reduction by 30% compared to the minimum mandatory required, by maintaining optimal microclimate parameters limits;
- improving the rest area conditions.

RESULTS AND DISCUSSION

Increasing with at least 10% of space allocated to each animal

The surface higher by 10% compared with that which sets minimum mandatory standards for protection of swine from categories of pigs for fattening, gilts and sows, gives increased welfare conditions by reducing the stress of cohabitation. Thus, increases feeding front, is easier access to drinkers and reduces stress produced during rest. Besides feeding, when animals from the box stalls are simultaneously involved, other physiological activities (drinking, resting) are dispersed in the remaining period of the day and are independent activities of animals they need space for.

Reducing the number of sows and gilts with 10% increases the free space for motion, reduces stress of cohabitation, reduces fighting for more space to forage and rest and the risk of hurts, contribute to a better batching of sows and gilts in preparation for service or calving. The measure imposes lowering the density fat pigs, gilts and sows by eliminating a sufficient number of animals out of the box stalls, so that each animal remained available space to increase by at least 10% compared to the density resulting from application of minimum mandatory norms.

Reducing pigs density on the surface leads to:

- reduce gas emissions into the atmosphere,
- reduce quantities of manure and wastewater,
- reduce feed consumption.

Table 1 presents indicators for minimum requirements and for the superior ones on space allocated to each category of pigs:

Table 1: Minimum and superior requirements on the space allocated to pigs

Indicator for superior requirement	Indicator for mandatory minimum requirement
The floor area available in superior welfare conditions: -pigs with a live weight between 50-85 kg - 0.605 m ² /head -pigs with a live weight between 85-110 kg - 0.715 m ² / head -pigs with a live weight over 110 kg - 1.1 m ² / head -gilts and sows kept in groups - 1.804 m ² / head, respectively 2.475 m ² / head	The minimum mandatory available floor area: -pigs with a live weight between 50-85 kg - 0.55 m ² / head -pigs with a live weight between 85-110 kg - 0.65 m ² / head -pigs with a live weight over 110 kg - 1 m ² / head -gilts and sows kept in groups - 1.64 m ² / head, respectively 2.25 m ² / head

Source: Ord. 149/13.07.2012; Ord. ANSVSA no.202/2006

Income losses by reducing the number of animals are due to a decrease of 10% of total sold production of fat pigs, piglets and breeding gilts. Savings achieved under this measure come from the reduction of feed consumption.

Ensure at least 11 hours / day artificial light with a lighting value of 50 lux

The light provides the normal metabolic processes of the animal body, a state of comfort to animals and easy access to the box facilities. Providing a lighting value of 50 lux requires, depending on brightness index of different types of buildings for accommodation of swine, additional consumption of electricity by lighting equipment. In this respect, by applying the measure, an additional consumption of electricity is registered. In the reproduction sector, the light ensures a normal breeding cycle at both sows and gilts and boars.

In Table 2, are presented the minimum and superior lighting requirements.

Table 2: The minimum and superior requirements on lighting for pigs

Indicator for superior requirement	Indicator for mandatory minimum requirement
Superior lighting conditions: -period of minimum 11 hours / day artificial lighting -50-lux lighting (at least a 150W power lamp every 33 m ² , in the time slot established through commitment)	Minimum mandatory lighting conditions required: -minimum of 8 hours / day lighting -40-lux lighting (at least a 100 W power lamp for each 42 m ²)

Ord. 149/13.07.2012; Ord. ANSVSA no.202/2006

Income losses and additional costs:

- cost of electricity consumed additionally for 3 hours / day;
- cost of electricity consumed additionally for a surplus of 10 lux 11 hours / day.

Improvement of pig welfare during transport

Improving the welfare conditions of pigs during transport is achieved by reducing the density of pigs during transport by at least 30%, so not to exceed 165 kg/m². This measure refers only to transport animals outside farm, or transport animals from other farms.

In Table 3 are presented the minimum and superior requirements on density for pigs during transport.

Table 3: Density of pigs during transport

Indicator for superior requirement	Indicator for mandatory minimum requirement
Density of pigs during transport must not exceed 165 kg/m ²	Density of pigs during transport must not exceed 235 kg/m ²

Ord. 149/13.07.2012; Reg. EC no.1/2005

Losses of income and additional expenses: 30% reduction in the density of pigs during transport involves additional costs for additional transport operations.

Correction of nitrites and nitrates level in the water

The quality water is essential for animal health and performance.

Usually, water is provided from own sources (wells drilled), or from surface water and does not meet levels of nitrites and nitrates specific to additional protective measures.

In order to ensure superior welfare standards for pigs, installations and equipment are necessary to correct level of nitrites and nitrates, by treatment with substances indicated by laboratory for environment chemistry (chlorine, salts, resins, etc.) and the use of filters and other materials. At these additional costs are added energy costs.

Correction of nitrites and nitrates level in water used for watering pigs directly affect the health of pigs (reduction treatments and drugs) and quality of wastewater.

In Table 4, are presented the minimum and superior levels of nitrites and nitrates in the water for pigs:

Table 4: The minimum and superior levels of nitrites and nitrates in the water for pigs

Indicator for superior requirement	Indicator for mandatory minimum requirement
Nitrates – 50 (mg/l) Nitrites – 0.5 (mg/l) $[\text{nitrates} / 50] + [\text{nitrites} / 3] \leq 1$	Nitrates + nitrites – 100 (mg/l) Nitrites – 10 (mg/l)

Ord. 149/13.07.2012; Ord. ANSVSA no.20/2012

Additional expenses attracted through applying this measure refers to treatment with substances indicated by the environmental chemistry laboratories (chlorine, salts, resins, etc.), and the use of filters and other consumables, as well as additional expenses for the source water quality control and after treatment (6 additional analyzes / year).

Pollutants reduction by 30% compared with the minimum mandatory level, by maintaining microclimate parameters in optimal limits

In order to ensure the physiological constants together with optimal conditions of accommodation, feeding, watering and hygiene, it is necessary that pigs to have provided the microclimate in optimal limits, leading to reduction of pollutants from animal shelters.

These factors (temperature, relative humidity, air volume per head and winds velocity) should always assured in optimal limits by adequate equipment and constantly monitored by specific sensors or control devices.

If the parameters of microclimate are maintained in optimum limits, does not accumulate gas (CO₂, ammonia, etc.) and excess dust, which are harmful to animals, may even be reduced to a level that provides superior comfort conditions to animals.

Reducing pollutants by maintaining microclimate within optimal limits, without variations affecting animals, reduces the risk of disease of pigs, increases immunity and improves their overall condition. Consequently, decreases the amount of medication needed for treatment of animals, decreases the amount of water consumed.

The pollutants reduction by maintaining microclimate conditions within optimal limits requires additional consumption of electricity.

The pollutants reduction by maintaining optimal intervals provides increased conditions for pigs protection, disease prevention, stress reduction, etc.

Table 5: The pollutants level in the shelter

Indicator for superior requirement	Indicator for mandatory minimum requirement
The pollutants level in the shelter in superior welfare conditions: -max. 10.5 mg/m ³ dusts -max. 700 ppm CO ₂	The pollutants level in the shelter in mandatory minimum conditions: -max. 15 mg/m ³ dusts -max. 1000 ppm CO ₂

Ord. 149/13.07.2012; Ord. ANSVSA no.20/2012

The additional expenses related to the application of this measure shall cover the consumption of additional electricity and additional expenses to change with increased frequency of air filters for pollutants reduction.

Improving conditions of rest area

To promote the animal welfare, given the investigated natural behaviour of pigs, it is necessary to be a dry area at all times for the rest period. A continuous dry resting area meets the

needs of physical and thermal comfort. For the area of rest, the minimum standard refers to a concrete area, which is washed and dried in the hall conditions.

Achieving of this zone with increased comfort needs the purchase and distribution of hygroscopic materials, which attracts additional expenses.

Table 6: Requirements for resting area of pigs

Indicator for superior requirement	Indicator for mandatory minimum requirement
The resting area in superior welfare conditions must be permanently kept dry, by using appropriate absorbent bedding material	The buildings for pigs must be constructed so as to allow the animals to have access to a physically and thermally comfortable resting area, drained and cleaned properly and to allow all animals to rest at the same time

Superior standards of welfare for pigs involve additional costs. The support for animal welfare is a form of fixed annual payments per livestock unit (LU) as compensation for loss of income and additional costs incurred by farmers, as shown in Table 7:

Table 7: Financial support for the welfare of pigs (Ord. 149/13.07.2012)

Specification	Fat pigs	Gilts	Sows
<i>LU conversion factor, according to Annex V of Regulation (EC) no. 1974/2006</i>	0.3	0.3	0.5
The amount paid annually to cover additional costs and loss of income due to the application of measures for animal welfare	EUR / LU/year	EUR / LU/year	EUR / LU/year
Pack 1 a) Increase by at least 10% of available space allocated to each animal	41.40	165.00	23.30
Pack 2 a) Ensure at least 11 hours / day artificial light with a lighting value of 50 lux	19.10	17.20	15.80
Pack 3 a) Improvement of pig welfare during transport	4.80	4.80	5.40
Pack 4 a) Correction of nitrites and nitrates level in the water	12.00	25.00	18.50
Pack 5 a) Pollutants reduction by 30% compared with the minimum mandatory level, by maintaining microclimate parameters in optimal limits	16.80	48.00	22.90
Pack 6 a) Improving conditions of rest area	7.20	15.90	13.10
TOTAL MEASURES EUR/LU	101.30	275.90	83.20

Ord. 149/13.07.2012

Although during the period that requires investments at farm level to ensure superior standards of animal welfare, increase the costs of production and revenues are down, after, these technological improvements in growth and exploitation conditions of animals become favourable factors for the increase in quantity and quality of production, the animals responding positively to optimization of production factors allocated, and finally leading to the efficiency of activities.

CONCLUSIONS

Besides the characteristics of products, farmers must meet the environmental and animal welfare norms provided by law, because they are related to protection of natural resources and a series of ethical requirements. Some products have added value because they come from a particular region or produced by a traditional method (quality labels), or because the methods of production pays special attention to environmental and animal welfare (eg. organic farming).

To act properly in order to promote a full welfare of farm animals is necessary to develop the scientific basis for assessing the welfare status, must be determined the value of ethics and human attitudes to animal welfare and must have developed tools to promote it at the farm level by other means than through legislation and policy.

For a realistic assessment of animal welfare, should be performed measurements on the production level, behaviour, anatomy, physiology, health and immunity. But we need to consider other factors such as:

- impact on the environment (soil, water, air);
- health and safety of employees and workers;
- farm economic efficiency;
- community interactions of farm (in connection with pollution or other factors).

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