ASPECTS ON THE CONSTRUCTIVE AND INTERNAL ORGANIZATION SOLUTIONS FOR THE TRANSFORMATION OF A PIG GROWING HOUSE IN BEEF CATTLE GROWING HOUSE

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Abstract

The present work highlights some aspects regarding the possibilities of transforming some shelters from pig farms, built before 1990, into spaces for the exploitation of beef cattle.

Cattle capitalize on agricultural by-products and waste (straws, cheeses, chickens, chickpeas, beets and beet noodles, pork in the processing industry, bran, mackerel) which they transform into essential foods for human food.

Cattle provide the raw material needed for the milk and meat industry. Meat and delivered products are important sources of energy, proteins, minerals, vitamins, essential amino acids, necessary for the proper functioning of human physiological mechanisms and for maintaining health.

The hall for raising pigs has a structure of reinforced concrete, the foundations are glass type, with pillars embedded in these foundations, supporting at the top end beams of the roof.

In the first compartmentalization version (V1), 16 cows / storage can be accommodated ensuring a total area of 162 m² and 10.12 m² / cow. In total, the 9 compartments can accommodate 144 cows.

For the calves there are 25 compartments with a total area of 337.5 m² and 2.25 m² / calf. There are also two compartments for calving on the ends of the shelter with 13.5 m² / compartment.

This variant provides an external feed lane for cows with a width of 3.5 m and an inner feed lane for calves with a width of 3 m.

In the second compartmentalization version, 108 cows can be accommodated, ensuring a total area of 1150.2 m² and 10.65 m² / cow.

The calves can be accommodated in the 18 storage boxes resulting from the compartmentation with a total area of 575.1 m², resulting in 5.32 m² / calf.

The forage in this variant can be made from a central alley with a width of 3.8 m.

Key words: beef, pig shelters, interior design, beef cattle

INTRODUCTION

The production of beef, by growth and fattening, is a source of profit, intensification and efficiency of agriculture through the superior use of cheap feed resources, which can be transformed into meat, a product with high biological and nutritional value.

Beef is an important source of food, a source of health, progress and civilization (Oancea et al., 1999, cited by Creangă et al., 2015).

The production of beef is currently a niche not sufficiently exploited by Romanian farmers, our country having great possibilities of production, through different technologies of beef for domestic consumption and export.

In recent years, despite the existence of a large global deficit of beef, consumption is showing growth trends. In order to meet the growing needs but also the increasingly refined taste of the consumer, the quantitative and qualitative increase of production is required. meat, transformation, modernization and use of all available spaces.

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The maintenance system represents an important link of the exploitation environment in cattle and consists in ensuring optimal conditions of shelter, microclimate, care and movement, meant to ensure the welfare of the animal, maintaining the health necessary to externalize the productive potential (Neaţă et al., 2011)

MATERIAL AND METHOD

The researches were based on the identification in the specialized literature, the systems of maintenance of the beef cattle and their adaptation for certain types of old pig shelters, respecting the minimum animal welfare norms.

The exploitation technologies were studied, observing that in the beef farms the free maintenance system is practiced, which must ensure an optimal space for each animal according to age and the body development, of a rest area, well-defined areas of movement and foraging area.

For the arrangement and compartmentalization, a study room for growing old pigs was taken, with plan dimensions (122.50 x 18.50) m, the height at the eaves 3.66 m and the height at the ridge 5.55 m.

RESULTS AND DISCUSSION

Any variant of free maintenance used, must comply with a series of requirements regarding the exposure of the shelter to (East or South-East), depending on the prevailing winds, ensuring good ventilation and avoiding drafts.

In order to avoid conflicts between animals it is necessary to compulsorily clear and provide a sufficient feeding front to avoid competition for food.

Providing quality water in a centralized watering system and containment devices for artificial seeding, respectively sanitary-veterinary interventions.

The free establishment in shelters with unobstructed outdoor movement area can be practiced in the calf production system - lactating cow, another variant being with covered outdoor movement area, inside it can be arranged in two variants, with permanent full bedding or bedding. permanently partial and scraped movement area.

For calves the collective compartments should be placed in a separate space, preferably in the suckling area.

In table 1, the minimum norms regarding the welfare of the calves are presented, and in table 2 the dimensions and capacity of the collective speakers.

Table 1 Minimum rules on calf welfare *(according to Directive UE 97/2CE/1997)*

INDIVIDUAL COMPARTMENT Only until the age of 8 weeksi	COLECTIVE COMPARTMEMTS Required after the age of 8 weeks
- the width of the individual compartment is at least equal to the height of the calf at the herd (minimum 70-90 cm depending on the age);	-1.5 m² / calf with a living weight less than 150 kg;
- the length of the individual compartment is at least equal to the length of the calf multiplied by 1.1 (minimum 120-150 cm depending on age);	-1.7 m² / calf with a live weight of 150 - 220 kg;
- the walls must not be compact but perforated so as to allow visual and tactile contact between the vines.	-1.8 m² / calf with a live weight over 220 kg;
	- requirements for a clean and comfortable bedding.

Table 2 Dimensions in plan of the collective speakers for the calves *Source: Creangă et al., 2015*

Specification	**Number of slots / compartment**		
	2 slots	**3 slots**	**4 slots**
Minimum surface area	3.60 m²	5.40 m²	7.20 m²
Width	1.65 m	1.80 m	2.25 m
Breadth	2.20 m	3.00 m	3.20 m
Width	1.80 m	2.15 m	2.40 m
Breadth	2.00 m	2.50 m	3.00 m
Width	1.90 m	2.35 m	2.70 m
Breadth	1.90 m	2.35 m	2.70 m

The free maintenance of cattle exploited for meat, represents the most widespread and efficient system of maintenance, which involves raising cows and calves outdoors or under conditions as close to the natural environmental factors, with permanent access to food and water.

Within the system of free maintenance in shelters with permanent litter and feed management at discretion, Neață et al., 2011, cited by Creangă et al., 2015, I propose a compartmentalization of the shelter that includes a feeding lane of 2 m wide, without litter, with the free access of the animals to the feeding area, a rest area with permanent litter for cows, calves for calves, storage for containment and a calving stall (figure 1).

The free-standing shelter uses permanent straw bed with a daily consumption of 8 kg / animal. The shelter is open on the S-E side which allows good heating for the entire rest area. The forage area is covered with a cover and the calves are located between the service alley and the area with permanent litter for cows.

In the shelters with permanent litter the free maintenance knows in practice different variants of application. A first option would be the free maintenance in shelters with the covered movement area, then the maintenance in shelters with the covered movement area and the sloping rest area, in shelters with nursery and collective storage rooms for vines, free maintenance on the bedding. with free assisted breastfeeding system and free maintenance on permanent bedding with free breastfeeding system.

Another shelter system, with deep bedding for 120 calves, can be with a common speaker maintenance system with a slope of 8%. The floor is full concrete, with driveways.

The feeding is done on the outside on an alley arranged on one of the long sides of the shelter.

The hall for raising pigs, has a structure of reinforced concrete, the foundations are glass type, with pillars embedded in these foundations, supporting at the top end beams of the roof (figures 1 and 2).

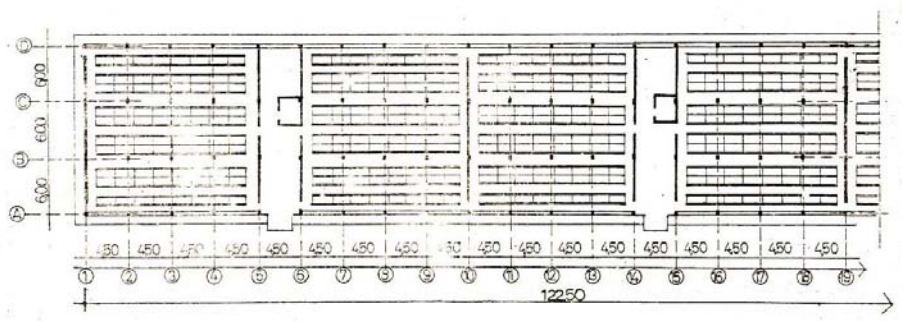

Fig. 1 The plan for a hall for raising pigs

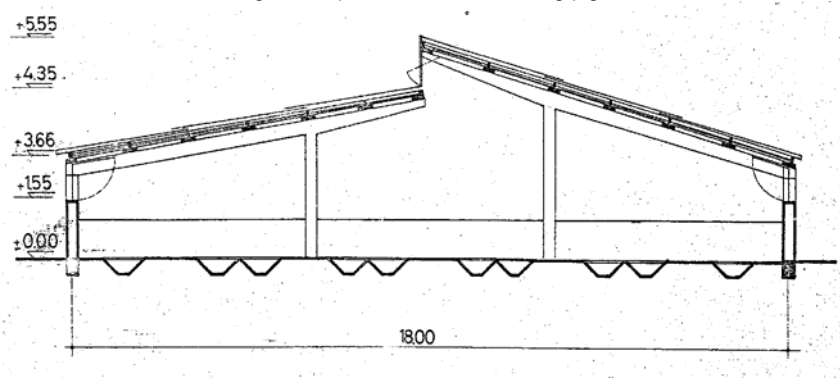

Fig. 2 Cross section of a hall for raising pigs

A first development operation consists of the dismantling of the machines, the partitions of the boxes for raising pigs and restoring the floor surface.

Several variants can be approached for the arrangement and compartmentalization of a shelter for raising pigs.

In a first embodiment (V1), a compartmentalization can be carried out in width which includes a common cattle storage box, with a width of 12 m, a common storage area for calves with a width of 3 m and a feeding alley for calves of 3 m.

On the length of the shelter the milk cows' box will have a length of 13.5 m, and the box for the calves a length of 4.5 m.

The surface of a common cows storage area will be 162 m², and of a common storage area for calves 13.5 m².

For the cows there will be provided an external feeding lane with a width of 3.5 m (figures 3 and 4).

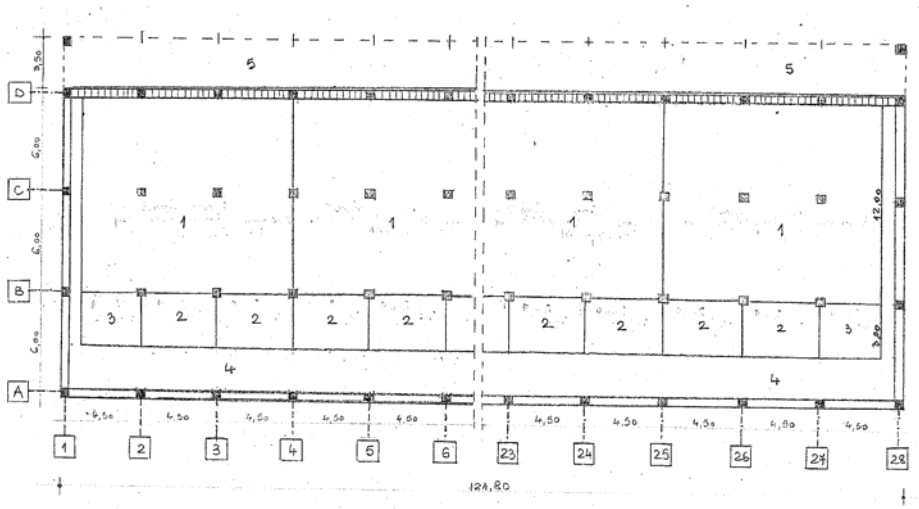

Fig. 3 Plan of a shelter for fattening cattle (V1)
1 – compartment for cattle; 2 – compartment for calves; 3 – delivery compartment ;
4 - interior alley for calves feeding; 5 - alee exterior alley for cattle feeding

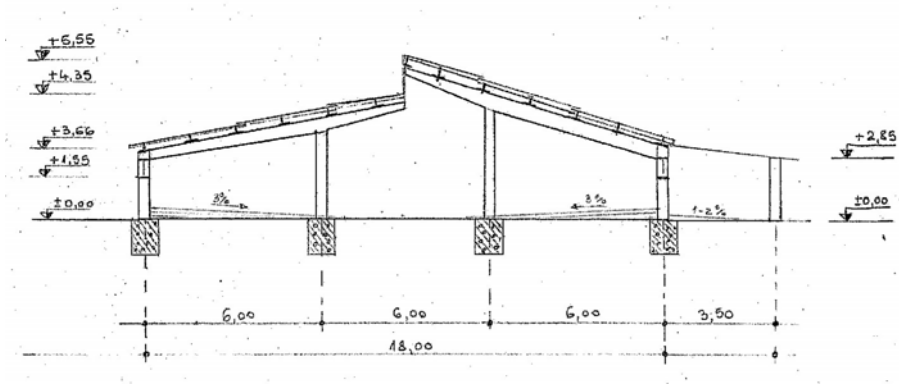

Fig. 4 Cross section of a shelter for fattening beef cattle (V1)

Another variant, (V2) could allow a compartmentalization in width that includes a central feeding alley with a width of 3.8 m, and on both sides of this alley a common storage for 3 cows, with the size of 5.95 m.

On the length of the shelter the box for 3 cows will have a size of 4.5 m, followed by a common storage for 6 calves with a size of 4.5 m and again a common storage for 3 cows, with a size of 4.5 m.

Following the use of this compartmentalization model, the surface of a common storage for 3 cows and the common storage for 6 calves will be 26.78 m² (figures 5 and 6).

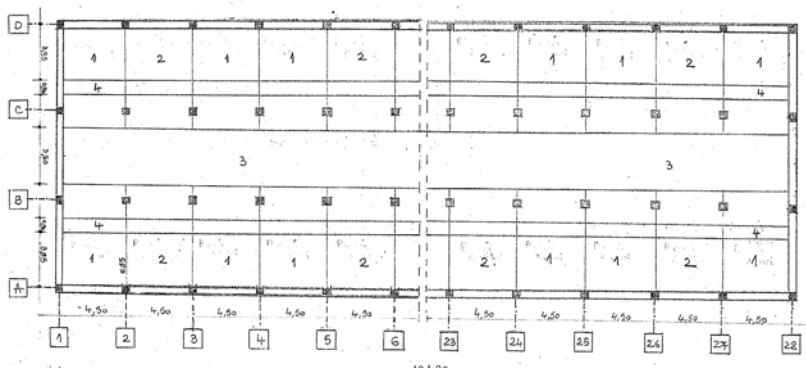

Fig. 5 Plan of a shelter for fattening cattle (V2)
1 – compartment for cattle; 2 – compartment for calves; 3 – central feeding alley;
4 - waste disposal channel

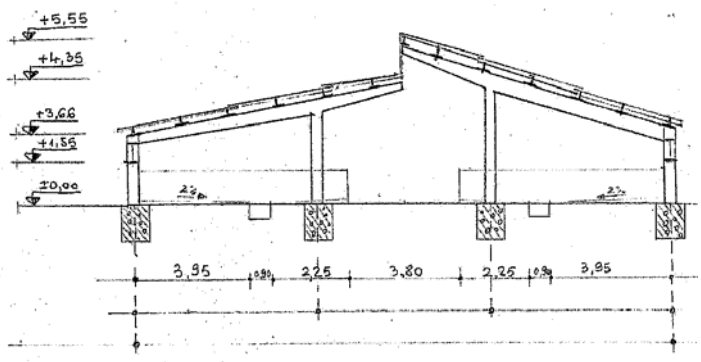

Fig. 6 Cross section of a shelter for fattening beef cattle (V2)

CONCLUSION

Some already existing and unused spaces can be transformed by minimum financial efforts into shelters for beef cattle fattening, depending on the market for the delivery of beef.

In the first compartmentalization version (V1), 16 cows / compartment can be accommodated ensuring a total area of 162 m² and 10.12m² / cow. In total, the 9 compartments can accommodate 144 cows.

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The calves can be accommodated in the 18 storage boxes resulting from the compartmentation with a total area of 575.1 m², resulting in 5.32 m² / calf.

The feeding in this variant can be done from a central alley with a width of 3.8 m.

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