

STUDY REGARDING THE FACTORS INFLUENCING THE NECESSARY OF SWINE EXPLOITED FOR MEAT PRODUCTION

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Abstract: Pigs that have as destination meat production will be feed differently depending on age and weight, because the necessary regardless of the expression way changes in an important way from one evolutionary phase to another. The necessary of energy will be differentiated according to the way the food is distributed, discretionary or restricted depending on the fattening phases. The necessary of protein and amino acids will be calculated according to the type of animals, the ones with fast-growing being fed at discretion or subject to moderate restriction. The factors with possibility to act on the efficacy of protein use can be classified into extrinsic and intrinsic factors, a general remark is the one that the need for protein varies in the opposite direction with the energy requirement being one of the reasons why the protein and amino acid requirements are expressed also depending on the energy.

Key words: swine, factor of influence, necessary, meat.

INTRODUCTION

The necessary of the swine can be defined as the amount of nutrients needed for a healthy animal within 24 hours but the reference can be made not only to a single animal but to a homogeneous group of animals. Because all the nutrients are important and must be provided at an appropriate level, the energy requirement is crucial because the insufficiency affects animal health, the energy requirement is most sensitive to environmental conditions because all transformations in the body are energetic transformations. [1,3,5,16,17,18]

The separation of energy needs in need of energy for maintenance and need of energy for production is rather theoretical than physiological, the necessary of energy for production depends by the composition of animal products. The higher the weight gain is in the lipid, the higher the energy needed to achieve it, because the fat deposition is more expensive, given the fact that it is very low the water content. On the contrary, protein synthesis, which also involves important water storage, requires lower energy consumption. The energy production requirement is basically independent of environmental conditions, it being related to the genetic value of the animal, instead the energy needs for maintenance is strictly dependent on the environment. [2,4,7,9,11,14]

Also the necessary for animals in proteins, minerals, and vitamins can be separated into need for maintenance and need for production, but most often they are expressed globally in relative values. In the conditions in which pigs feed refers to a batch and not individually one it can be speak of a collective need, derived from the heterogeneity, more or less pronounced, of the animals constituting that batch. There is, in this situation, an increase in necessity because it is the issue of meeting the requirements of all animals. The practical consequence is a waste of nutrients in less performing animals in the batch. Therefore, the standard known in the literature as "feed standards" or "food recommendations" represents the need for an increase with a "safety factor" of between 5 and 20%. This is due to several uncertainties about: [6,8,10,12,13,15]

- raw materials;
- the heterogeneity of compound feed;
- the exact knowledge of the necessity;

- the forecast of the quantities of fodder consumed;
- pathological risks;

MATERIALS AND METHODS

Swine whose purpose is the production of piglets for breeding or meat are feed differently according to their age, weight, because the needs change in an important way from one evolutionary phase to another because some extrinsic or intrinsic factors influence the effectiveness of the use of nutrients from rations. Based on this study, we analyzed the factors influencing the needs of pigs exploited for meat production.

RESEARCH RESULTS

Taking into account both nutritional and practical considerations, the feeding of pigs raised and exploited for meat production should be done in four phases:

- for weaning (piglet of age I), meaning up to 21-28 days or 6-10 kg;
- weaning (piglet of age II a) from weaning to 25-30 kg;
- fattening I up to 55-60 kg;
- fattening II, until slaughter (100-110 kg).

The energy requirement will be differentiated according to the way the food is distributed:

a) if the food is administered at its discretion, in digestible energy (ED) per kg of compound feed or per kg of feed with 87% SU (in the case of the use of the metabolisable energy system -EM- ED is multiplied with 0.95). In this case, the energy requirement for the pre-weaning phase and for the other nutrients and the other four-phase will be presented in Tables 1 and 2 after INRA and refers to pigs with a fast growing.

Table 1.

The need for energy, protein and amino acids of piglets and fatty pigs

Specification	Piglets		Pigs grew fat	
	Age I	Age II	Age I	Age II
Weight (kg)	6-10	10-25	25-60	60-100
Dry substance (%)	90	90	87	87
Energy (kcal ED/kg feed)				
- limits	3300-3600	3300-3600	3000-3400	3000-3400
Crude protein (%)	20-22	18-19	15-17	13-15
Lysine (%)	1,40	1,20	0,80	0,70
Methionine + cystine (%)	0,80	0,65	0,5	0,42
Triptofan (%)	0,25	0,20	0,15	0,13
Treonin (%)	0,80	0,65	0,50	0,42
Leucine	1,00	0,80	0,60	0,50
Isoleucine	0,80	0,65	0,50	0,47
Valine	0,90	0,70	0,55	0,50
Histidine	0,34	0,29	0,20	0,18
Arginine	0,36	0,32	0,25	0,20
Phenylalanine + tyrosine	1,30	1,00	0,80	0,70

Table 2.**The necessary for minerals and vitamins of piglets and pigs has been fattened**

Specification	Piglets	Pigs fattened	Specification	Piglets	Pigs fattened
Calcium (%) Small *	1,30	0,95	Vit. A (IU / kg)	10000	5000
Calcium (%) Large	1,05	0,85	Vit. D (IU / kg)	200	1000
Phosphorus (%) Small	0,90	0,60	Vit. E (mg / kg)	20	10
Phosphorus (%) Large	0,75	0,50	Vit. K (mg / kg)	1	0,5
Iron (mg/kg)	100	80	Vit. B1 (mg / kg)	1	1
Copper (mg/kg)	10	10	Vit. B2 (mg / kg)	4	3
Zinc (mg/kg)	100	100	A. pantot. (Mg / kg)	10	8
Manganese (mg/kg)	40	40	Vit. B12 (mg / kg)	0,03	0,02
Cobalt (mg/kg)	0,3	0,1	Niacin (mg / kg)	15	10
Selenium (mg/kg)	0,3	0,1	Biotin (mg / kg)	0,1	0,05
Iodine (mg/kg)	0,6	0,2	A. folic (mg / kg)	0,5	0,5

For the post-fattening phase (age 2, piglets with weights of 10-25 kg, responding to related to the concentration of food energy in a manner similar to pigs fattening instead for fattening phases, the energy content of the feed can be situated within fairly wide limits, 3000 3400 kcal ED/kg, because the pig can manage its energy intake when food is administered at its discretion.

In the case of the use of more energetically diluted food regimes, there is an increase in food consumption to the detriment of the average daily increase, but the results are better at assessing the quality of the carcasses, most of them being in the higher grades at the SEUROP grading. It can be concluded that at pigs of lower genetic value, which tend to deposit fat in the carcass, it is recommended to use feed with lower energy levels, 3000-3200 kcal ED/kg, and commercial hybrids specializing in meat production rations containing 3400 kcal ED/kg. The size of the energy level may also be imposed by the basic raw material entering in the feed structure, for barley feeds containing 3000-3100 kcal ED/kg and for wheat or maize 3300-3400 kcal ED/kg for feed.

b). if food is administered restricted in ED/head/day. In this case in the pre-weaning phase, if the risks of gastric disturbances are eliminated, the piglets receive food almost at their discretion, for this reason the average consumption of fodder falls within the limits of:

- the age of baby piglets;
- the weight at weaning;
- the health status;
- the season;
- the body reserves.

The performance achieved in practice by implementing such a restriction program for commercial meat hybrids is within the following parameters:

- piglets of first age:
 - average daily gain 215-168 grams;
 - specific consumption/kg spores 1.25-1.35 kg;
- piglets of age 2:
 - average daily gain 500-650 grams;
 - specific consumption/kg spores 1.35-1.65 kg;
- fatty pigs:
 - average daily gain 650-850 grams;
 - specific consumption/kg 2.8-3.3 kg.

The protein requirement refers to animals of "meat type", with a fast-growing, fed

at discretion or subject to moderate restriction, the rules indicating in grams/1000kcal ED the following quantities for the 4 phases:

- piglets at age I: 57-63 g/1000 kcal ED;
- piglets at age II: 50-54 g/1000 kcal ED;
- fatty pigs Phase I: 45-53 g/1000 kcal ED;
- fatty pigs Phase II: 40-47 g/1000 kcal ED.

In the case of amino acids, the recommendations made by the norm show that the phases need to cover according to weight and age:

- Lysine 2.2-4.0 grams/1000 kcal ED
- Methionine and cystine 1.3-2.3 grams/1000 kcal ED;
- Tryptofan 0.4-0.7 grams/1000kcal ED;
- Treonine 1.3-2.3 grams/1000 kcal ED.

Factors susceptible to act on the efficacy of protein use can be classified into extrinsic factors, those related to growth conditions (diet, nutrition level, energy intake, vitamins, minerals, temperature) and intrinsic factors, those who look the proteins themselves. A general remark is the one that the need for protein and amino acids varies in the opposite direction to the energy requirement. It is one of the reasons why the protein and amino acid requirements are also expressed in terms of energy.

Genotype, race, gender influences the necessary of amino acid, because differences between genotypes are important, driving a dynamics of growth and composition of commercial swine hybrids for meat production, requiring a more concentrated diet in protein and amino acids. As regards sex, it is known that at the same energy supply, the protein and amino acid requirements of females exceeds the necessary for castrated males in the second phase of fattening due to the storage of a larger amount of meat in the carcass (Dourmad et al. 1995).

If the castrated males are subject to a food restriction during the finishing period, in order to limit the fat deposition from the carcass, the relative protein and amino acid requirements increase relative to that calculated at a food at discretion. The necessary for protein and amino acids decreases, along with the arrival of older and weight pigs.

The level of feeding and the provision of the energy requirement on the 4 phases are as follows:

- During the lactation period, the protein requirement may be independent of energy intake provided that there is an optimal ratio between all essential amino acids;
- In the growing fattening period, the nitrogen requirement must be assured according to the energy level. Increasing the feed concentration in the protein reduces the fat deposition in the carcass, the feed energy being directed to the synthesis of the meat and only then to the fat synthesis.

On balanced vitamins and minerals, the amount of food ingested determines:

- the almost linear increase of the meat and fat store to a certain point;
- thereafter, at higher amounts of food, the protein deposit is flattening and the fat deposition continues to increase.

CONCLUSIONS

The energy requirement for commercial meat hybrids varies according to feed distribution, age and body weight, and the need for protein and amino acids will be calculated according to genotype, since animals with high growth rates need to be fed at discretion or with moderate restrictions. The necessary of protein and amino acids vary in the opposite direction to energy need for these reasons the nutrition levels must be differentiated on the 4 phases of swine breeding and exploitation for meat production so

during piglet feeding the need for protein must be independent by the energy intake if the optimal ratio between essential amino acids is maintained and in the growing fattening period the protein requirement must be insured according to the energy level. Increases in protein, in rations, cause fatty pigs to lower fat deposits in the carcasses, because feed energy is used to deposit meat in the carcasses and then in fat.

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