MEASURES TO IMPROVE THE BREASTFEEDING CAPACITY OF SOWS EXPLOITED IN PROFESSIONAL FARMS

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Abstract: *The milk production of sows is influenced by genetic and environmental factors, but through its specialization, the raising of piglets for fattening by increasing prolificacy requires special management measures specific to the puerperium, for the economy of exploitation. The daily milk production of the sows has an ascending trend from the eighth day to 21 days reaching the maximum level during this period, it is kept in the plateau for a few days then it starts to decrease up to 28 days of lactation. For the efficient exploitation of sows for the production of piglets for fattening, prolonging lactation in sows after 28 days is not beneficial due to the decrease in the index of use of sows and obtaining a lower number of piglets per sow per year. Stimulating the milk production of sows in the puerperium can be achieved by implementing new managerial measures that contribute to improving the management of the puerperium and directing nutrition according to the evolution of the puerperium period.*

Key words*: management, sows, lactation, puerperium*

INTRODUCTION

There are often differences between production forecasting and achievement of objectives that require decisions to be made regarding the farm as a whole, production, processing, capitalization or certain sectors of the farm, being necessary to know the sensitive points of intervention on the farm and solve major problems which is facing [2,3,6, 11,16]. A number of measures are required to ensure:

- adapting the size of the farm to the biological characteristics of different categories of animals;
- adapting the volume of activities necessary for the breeding and exploitation of animals to the capacity of processing, and their capitalization to the possibilities of production systems modernization;
- adapting production to the competitiveness of the food system [9,15];
- evaluation of the results or technical-economic and financial performances of the activity [8,12];
- evaluation and use with high efficiency of own and attracted financial resources;
- implementation of the most modern technologies on the entire production chain [1, 10];
- setting the correct objectives to be achieved.

The most important functions of a professional swine farm integrated, production-processing-distribution-capitalization on the market, highlight the degree of performance, and can be grouped as follows [4,7]:

- the coordination of productive activities, which must be competent, timely and efficient;
- decision making;
- technological management, which consists in ensuring the functioning of all production sectors with minimum expenses and qualitatively superior productions at the optimal level;
- organizing all productive activities;
- economic forecast;
- to achieve a maximum productivity, with minimum expenses per unit of product.

The entire productive activity is based on:

- a production plan;

- production processing;
- capitalization of the obtained products.

The management on the entire production-processing-distribution chain on the market is exercised by the following managerial bodies: the general meeting of shareholders, the board of directors, the management committee and the natural persons-managers or administrators. The existence of several decision centers, farm, sectors, markets, makes it necessary to coordinate, by senior management, all decision-making activities, so that they act in order to achieve the objectives, the convergence of decisions being absolutely necessary for the system to evolve:

- on the fixed trajectory;
- depending on the management's forecast.

Because we speak about integrated farms in the meat sector, for example, along with the acts and decision-making processes exercised by the bodies, positions and managerial functions, respecting the competencies assigned to them, it is possible to resort to management methods to improve the activity [5,14]. Participatory management being institutionalized, through the bodies that operationalize it, decisions are substantiated and more rigorous. In the case of the group of professional farms integrated on piglet production, fattening, processing, capitalization, it is recommended in decision making and other methods according to the management by objectives because the professional swine farms behave as spending centers, for these reasons it is necessary for them to set objectives according to the specifics of the activity and specialization in obtaining processed products [10,13].

Improving the breastfeeding capacity of sows farmed on integrated professional farms, aims to provide food for piglets in the first days of life, because their digestive system is not ready for feed consumption, their main food in the first week of life being breast milk. Due to the increased prolificacy in calving15-16 piglets, their high growth rate, managerial measures are required to stimulate milk ejection. The secretion of milk in sows begins shortly before the parturition of piglets, its release being under the influence of hormones, oxytocin, secreted by the posterior lobe of the pituitary gland, whose action causes contraction of mammary gland cells and milk ejection, determined by stimulating piglets.

The elaboration of the lactogenic hormone is done under the action of some stimulus, but the piglets play a main role, their massage determining the ejection of the milk. Total milk production of sows varies according to parity and influences:

- the weight of the piglets at weaning;
- meat production obtained during one year of production;
- meat quality;
- consumer loyalty for a certain processed product.

MATERIALS AND METHODS

Sow's milk changes its composition throughout the whole period, from calving to weaning, the piglets as follows:

♦ in the first 48 hours the colostrum changes its amount of protein from 17.82 grams/100 grams to reach weaning at 5.95 grams/100 grams of milk;

♦ because the placenta does not allow the transfer of antibodies from sow to piglet, this is done in the first 3 hours after calving through milk;

♦ piglets that do not consume colostrum, do not benefit from antibodies and usually die, not ensuring the necessary biological material for fattening and production of meat/sow per year in economic conditions;

♦ colostrum also has a purgative role, being richer than 7, 2 times in vitamin A and almost 3 times in protein;

♦ due to its special composition, consumed by piglets, it ensures a very high growth rate in a week, they double their birth weight.

The purpose of this research was to analyze the milk production of sows farmed on a professional farm according to the serial number of calving, the main objectives being:

- hierarchy of sows according to parity;
- determination of milk production by indirect methods;
- determination of the weight of the piglets at weaning

To determine the quantitative milk production of the sows according to parity, the daily increase of the piglets was analyzed by weighing before and after breastfeeding.

RESULTS AND DISCUSSIONS

Milk production of sows is influenced by genetic and environmental factors, but through the specialization of purebred breeding and hybridization in the direction of increasing prolificacy and implicitly the amount of milk, provides economically necessary piglets in the first 10-12 days of life. The week of lactation, the quantity and quality of fodder administered to the sows in the puerperium influence the milk production of the sows:

- in the first 21 days milk production has an upward trend and can be increased by:
  a. stimulating feeding of sows;
  b. wet fodder at discretion;
  c. improving microclimate and welfare conditions;
  d. implementation of the best management of the puerperium.
- after 21 days the production is maintained in the plateau and decreases slowly up to 35-42 days;
- after 42 days and until the end of lactation in traditional farming systems, the decrease of the production is very pronounced although there are exceptions when between 35-56 days in some sows to see an increase in milk production.

Milk production of sows can be stimulated by other managerial measures implemented in the puerperium:

a. the amount of water provided to females in the puerperium;
b. type of feed and method of administration, dry or wet;
c. exploitation technology;

The duration of the lactation period determines the milk production that varies for the hybrids used to obtain piglets intended for fattening depending on the age of the puberty as follows:

Table 1.

Variation in milk production at sows

Item (kg)	Daily production			
	1-7 days	8-14 days	15-21 days	22-28 days
Milk production (daily)	7.53±0.22	8.28±0.41	8.67±0.33	7.44±0.78
Breastfed piglets	11.58±0.23	11.18±0.34	11.12±0.42	11.09±0.21

It results that the daily milk production of the sows' increases from the eighth day to 21 days reaching the maximum level during this period, when the lactation capacity of the sows is determined and then the production starts to decrease up to 28 days. For the efficiency of the exploitation we consider that prolongation of lactation is not beneficial due to the decrease in the sow utilization rate and the obtaining of a lower number of piglets per sow per year. Due to the increase in milk production of sows with the increase

in the age of piglets up to 21 days, we recommend to stimulate the milk production of sows:
- the stimulating feeding in the first days of lactation of the sows with fodder that would determine the increase of the production;
- adapting the exploitation technologies for the discretionary feeding with wet fodder of the sows during the entire lactation period;
- ensuring the movement of the sow in the box;
- automation of microclimate factors in order to reduce the influence on milk ejection;
- exploitation of the biological properties of the sow producing milk in the first 21 days of breastfeeding by stimulating the piglets;
- reduction of the sow replacement rate, use up to parity 6-7, to obtain a high milk production.

Variation in the number of sucks during a day at12 piglets at 12-day-old. During 24 hours the milk production of the sows varies from 8 to 8 hours in this way:

a. 04.00- 12.00 - five sucks- milk production was = 2.51 ± 0.34 kg

b. 12.00-20.00 - seven sips - milk production = 2.97 ± 0.51 kg

c.21.00 -04.00 - eight sucks- milk production = 3.78 ± 0.17 kg.

It is observed that between 21-4 hours, the number of sucks is the highest, the total milk production per 24 hours was 9.26 ± 0.36 kg, representing for this time 40.82% compared to of 27.18% between 4-12 hours and of 32.00 between 12-20 hours. It is found that technological actions such as work schedule have a stressful effect on the behavior of sows and piglets influencing the frequency of sucking and quantitative milk intake, because stress, changes in microclimate factors have negative effects on milk ejection and number of sucks.

Variation in the number of milk ejections depending on the age of the piglets. Analyzing this aspect in suckling piglets, we found that the number of sucks varied to 8 lots as follows:

- 0-24 hours the number of sucks was between 22-28 sucks;
- 7 days, 19-21 sucks;
- 14 days 16-17 sucks;
- 21 days 14-15 sucks;
- 28 days 11-14 sucks.

Researching the ethology of suckling in piglets we noticed that it takes place in phases, according to the following ritual, because the ejection of milk in sows is done under hormonal action with the intake of piglets as follows:
- squeaking, agitation to provide food 8-10 seconds activities quantified by agitation;
- stimulating the sow's attention, 10-17 seconds, activity quantified by placing the infant in a supine position;
- stimulating the elimination of lactogen hormone and relaxation of the alveoli for the flow of milk through the two galactophore channels, a process that lasts 58-175 seconds, quantified as a stimulation massage by the piglets;
- waiting for milk ejection 13-15 seconds, quantified process in adapting the tongue in the form of a gutter for milk ingestion;
- feeding process 20-30 seconds, counted in the swallowing of milk, when the pubes are inert and the milk is swallowed without them showing sucking activities;
- the end of the sucking process quantified by the end of the feeding, which will be repeated going through the same stages after a time interval of 52-127 minutes.

The whole process of ejection of milk to the sow lasts a minimum of 109 seconds and a maximum of 247 seconds, the last sequence, ending with squeaking and agitation confirming the end of breastfeeding. We find that the lactation period, the duration of sucking is influenced by.

- the evolution of lactation according to the age of the piglets;
- sow parity;
- number of suckling piglets;
- batch uniformity.

Nipple positioning. Piglets at parturition depending on weight, on the partition are oriented towards the anterior nipples which are more vascularized and have more developed alveoli producing more milk than the posterior ones. Each piglet, depending on its prolificacy and weight at calving, chooses a nipple from the 7-8 pairs it tries to maintain. The production of the first pectoral nipples according to the sucking position of the 12-day-old piglets was:

- left nipple 40.30 grams;
-nipple 1 as 38.90 grams;
- left 4 nipple 35.80 grams;
-nipple 4 as 34.30 grams;
- left nipple 33.50 grams;
- nipple 6 straight 33.10 grams.

We find that the amount of milk ejected at a suck is on average:

- first pair: 39.60 grams;
- fourth pair: 35.05 grams;
- sixth pair: 33.30 grams.

We find that the nipples located on the left side secrete a larger amount of milk, due to stronger vascularity and considering that from 4.16 kilograms of milk is obtained a kilogram of weight gain piglets that at one week of age make at least 19 sucks kg of weight gain only from milk is made:

• in suckling piglets at the pectoral nipples in 5.53 days they double their weight at birth;
• in piglets breastfed in the fourth pair in 8.85 days it doubles your weight.
• in suckling piglets in the sixth pair in 9.40 days;

For these reasons, we consider that in order to maintain the batches of piglets' uniform, it is necessary:

- discreet feeding of sows from 3 days after calving with wet feed and providing water at discretion;
- additional feeding from 5 days of piglets to provide additional nutrients, especially since the pairs of nipples 5,6,7,8 do not provide the piglets' need for growth and development;
- temperature control in shelters, ensuring a level of 20-22 degrees C for sows and one of 26-28 degrees C for piglets;
- balancing the uninsured need through the intake of milk with fodder with a high degree of digestibility for the early development of the digestive tract of piglets.

Number of piglets per nest. The number of suckling piglets has a major influence on the milk production of sows, the suckling capacity being higher in secondary sows compared to primiparous sows. In professional farms specialized in the production of piglets for fattening, the following indicators must be developed in order for them to have good economic efficiency:

- the average prolificacy of 15-16 piglets at one calving;
- in index of use of sows 2.5 calving per year;
- piglets made on a sow per year 35-37.50.

Achieving these indicators requires that the sow replacement rate be 23-25% with primiparous. In sows used for the production of piglets for fattening, the number of suckling piglets influenced the suckling capacity as follows:

♦ at primiparous breastfeeding capacity at 21 days was 54.57 ± 0.45 kg, with an average of 6.01 ± 0.64 kg per piglet (9.08 ± 0.22 piglets per sow);

♦ at the secundiparous feeding the breastfeeding capacity was 65.31 ± 0.70 kg with an average of 6.39 ± 0.41 kg (10.22 ± 0.25 piglets per sow);

♦ in multiple sows 5-6 calves calving the breastfeeding capacity was 65.80 ± 0.57 kg with an average of 6.42 ± 0.33 kg per piglet (10.25 ± 0.38 piglets per sow).

The influence of the calving order number on the milk production of the sows.

The age of the sows is an important factor for the farm managers who forecast the productions obtained from the pigs, because the proportion in which the sows in different categories are in fact influences the prolificacy, the lactation capacity and the reproductive capacity of the sows. The amount of sow's milk varies depending on the number of calving as follows:

- it is lower at the first lactation, due to the lower prolificacy of primiparous;
- increases in lactations II, III and IV and V;
- is maintained in the plateau in the sixth lactation in good mother sows then begins to decline.

In professional farms the economy of exploitation for the production of piglets is from the third to the sixth calving because the prolificacy is also given by the individuality besides:

- number of functional nipple pairs;
- position of the pairs of nipples;
- exploitation technology;
- nutritional level;
- biological productivity of the sow.

The number order of calving influenced the milk production of the sows as follows:

• primiparous sows have a breastfeeding capacity between 49.44 ± 0.15 and 54.57 ± 0.45 kg;

• secundiparous sows to calving II - IV, have a breastfeeding capacity of 58.34 ± 0.48 and 65.31 ± 0.70 kg;

• sows at calving V-VI, 63.28 ± 0.69 and 65.80 ± 0.57 kg.

In order to stimulate the milk production of the sows in the puerperium, the researches show the need to implement managerial measures that would contribute to the improvement of the management in this physiological phase of the sows. These measures concern:

- implementation of managerial measures on maintenance and welfare
- directing nutrition according to the evolution of the puerperium:

a. before parturition with we recommend a restrictive feeding of sows and providing water at discretion;

b. incentive feeding with quantities of 2.0 kg the first 5 days after calving;

c. doubling the amount of feed to 4.0 kg between 6-10 days;

d. wet feeding at discretion between 11-25 days;

e. reducing the amount of feed to 3.0 kg 2-3 days before calving; 11-26 days - 5.0 kg/sow/day combined feed, water at discretion;

We believe that in professional farms, which have implemented modern exploitation technologies, the best puerperium management must be implemented to ensure:

- discreet feeding with wet feed of sows from the first day of parturition;

- the use in the feeding of lactating sows of fodder that stimulates the ejection of large quantities of milk;
- stimulating the increase of consumption by ensuring the sowing of the sows 3 times a day;
- the formation of conditioned reflexes in sows regarding the feeding, by starting several times the feeding installations;
- synchronization of calving through the use of prostaglandins;
- use of oxytocin after calving to trigger lactation;
- implementation of the best veterinary management for the biosecurity of sows and piglets;
- increasing milk production by using biological material with high prolificacy of 16-17 piglets/sow.

CONCLUSIONS

The milk production of sows determines the norm of food administered according to the age of the piglets and has a major importance in the first 21-28 days of the piglets' life, it being influenced by a series of genetic factors as well as by the exploitation environment. The week of lactation, the quantity and quality of feed influence the milk production of sows, in the first three weeks the production has an upward trend and can be increased by managerial measures, then begins to decrease, slowly depending on the duration of breastfeeding. During the day, the milk production of sows varies, due to the number of sucks which is higher at night and lower during the day when technological activities are carried out in the shelters and with the aging of the piglets, when the quantity of milk decreases and must be supplemented with fodder to meet the needs of piglets. The whole process of ejecting milk to the sow lasts between 109-247 seconds, the last sequence of sucking being ended with squeaking and agitation confirming the end of breastfeeding, the duration of sucking being influenced by the evolution of lactation depending on the age of piglets, sow parity, number of suckling piglets and uniform lots.

The number of piglets from the group influences the milk production of the sows, as well as the age of the sows, the primiparous ones have a lower lactation capacity due to the lower prolificacy but the pluriparous sows have a high lactation capacity and wean a large number of piglets. We recommend for the increase of milk production of sows exploited in professional farms specialized for the production of piglets intended for fattening, the use of modern exploitation technologies, which allow in the puerperium the fodder at the discretion with wet fodder of sows from the first day of parturition, the use of lactogenic feed in food, the stimulation of consumption by the formation of conditioned reflexes in sows on feeding, the use of oxytocin to trigger lactation and the maintenance of the large number of piglets in the nest and the biosecurity of sows and piglets.

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