WAYS OF ASSESSING MANAGERIAL EFICIENCY OF REPRODUCTION IN PURE BREED SWINE

MODALITATI DE APRECIERE A EFICIENȚEI MANAGERIALE A REPRODUCȚIEI DE SUINE DE RASĂ PURĂ

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Abstract. *Economic success, i.e. obtaining profit on swine farms is influenced by managerial factors that ensure performing standards of reproduction parameters in swine by diminishing service period and by achieving a calving interval between 152-154 days. Obtaining from each sow 2.37-2.40 calvings per year over a longer period of exploitation (6-7 calvings) contributes to the recovery of occasional expenses with the raising of breeding stock until the optimal age for reproduction.*

Rezumat. *Succesul economic, obținerea de profit de către fermele de creştere şi exploatare a suinelor este influențat de factorii manageriali care asigură obținerea unor standarde performante ale parametrilor reproductivi la scroafe prin reducerea service period-ului şi realizarea unui calving interval cuprins între 152-154 zile. Obținerea de la fiecare scroafă a 2.37-2.40 fătări pe an pe parcursul unei perioade de exploatare cât mai lungi (6-7 fătări) contribuie la recuperarea cheltuielilor ocazionate de creşterea prăsilei până la vârsta optimă de reproducție*

Key Words: *swine, managerial factors, efficiency of reproduction, service period, calving interval.*
Cuvinte-cheie*: suine, factori manageriali, eficiența reproducției, service period, calving interval.*

INTRODUCTION

The process of reproduction plays a very important role in economic success on pure breed farms. In order to get a large profit per sow (the selling of 12-14 capita of breeding material per year) it is important to monitor their reproduction activity, the diminution to the minimum of the preparation for seeding, the maintenance in exploitation for an as long as possible period of time (6-7 calvings). It is only through a performing management at the farm level that we can diminish reproduction periods and that farms can be maintained in production for many years (CORNELIA PETROMAN, 1998).

In order to get maximum reproduction efficiency, each sow should reproduce on a certain frequency basis (2.37-2.40 calvings per year) over a period of exploitation as long as possible, so that we can recover occasional expenses on the breeding and testing of the sows until they reach optimal age for reproduction (180-190 days).

MATERIAL AND METHODS

When man takes over nature's responsibilities (artificial insemination, gene transfer) he should know the physiology of reproduction in the animals he raises (Landrace sows, for example) and try to develop some skills that allow intensifying reproduction. The reproduction function in sows includes the following: production of ovocites, fecundation, gestation, and parturition that are all regulated on a hormonal basis (BOGDAN, 1999; DINU, 2002; IOAN PETROMAN, 1997). Hypophysis, a gland that also regulates other functions of the body, releases a larger or smaller dose of FSH that can stimulate or not the growth of ovary follicles hosting ovocites. After ovulation, there is a yellow body forming on the ovary in the place of the ovulating follicle, as a result of the luteine hormone action (LH) (STOICA, 1998).

In order to get maximum efficiency on a pure breed swine reproduction farm we think it is necessary to know the main elements that make up the performing management of sows' reproduction through the development of the main factors contributing to the success of exploitation.

RESULTS AND DISCUSSION

By accomplishing some exploitation conditions observing the main parameters of production management, positive economic results are not long to appear. Thus, we think it is necessary to observe the following conditions:

a) Closely know the reproductive function of each sow, its physiological state at every moment, the way the different sexual elements are produced, fecundation, and nidation, gestation control 35 days after insemination, parturition, and puerperium.

b) The calving interval. The frequency of calving significantly influences piglet production on the farm, the ideal being that each sow have a use index of 2.37-2.40 calvings per year, with exploitation duration of 6-7 calvings.

The duration of the interval between two calvings covers the preparation period for a new insemination that shall not be longer than 6-10 days, followed by a gestation period of 113±6 days and breast feeding for 25-28 days, so that the calving interval be no longer than 155 days.

The main factors influencing calving interval are: duration of the post-weaning – gestation period, and conception rate. Pure-breed swine farms on which reproduction is well managed reach gestation only after 1.3-1.5 inseminations. When one needs 1.5-1.8 or more inseminations to reach gestation, the farmer should search for causes that depend not only on the artificial insemination techniques but also on the quality of the inseminating material, on the optimal time for inseminating, and on the management of exploitation of reproduction animals.

c) Proper identification of sows in oestrus (perfect immobility). Establishing optimal time for insemination is impossible if heat was not properly identified. The most certain sign of heat is the immobility reflex, when the female agrees to be mounted by other sows and shows immobility during the boar trial and the man trial. Numerous studies we have carried out show that monitoring for identifying heat should start in the morning and be repeated at least twice a day if we want to get 92-97% of the sows in heat.

d) Optimal insemination time. After proper identification of females in oestrus, the most important factor of reproduction efficiency is the insemination time. The system we recommend asks for inseminating females in heat in the morning and for a second insemination the next morning if the females show the immobility syndrome. For females in oestrus in the afternoon, insemination shall be done the same afternoon and the next morning. In females inseminated twice and at recommended intervals, conception rate is very good, and the non-return index is very low.

e) Nutrition in accordance with physiological state. The age of sexual maturity (puberty) is influenced by the nutritional level of feed portions. Growing females fed on low-protein feed reach puberty 2-3 months later than females fed on protein-vitamin-mineral balanced portions that reach 118-120 kg upon puberty (6-7 months of age).

Sow weight losses during breast-feeding contributes to the increase of the preparation period for insemination from 6-8 days to 35-40 days and prevents them from reaching the use index of 2.37-2.40 calvings per year.

During gestation, with the appearance of anabolism and with the confirmation of the gestation, females shall be fed with restrictions; thus, the portions should not be larger than 2.2-2.4 kg per day per capita. During the last period of gestation, their feed should contain

balanced quality forage as it is the period in which development rate in conception products is the most intense (Table 1).

Table 1

Development of conception products per gestation periods in the Landrace breed

Age (days)	Average weight (g)	Length (mm)
21	0.15-0.23	4-7
35	11.20-12.80	32-45
75	251.40-265.65	135-148
95	430.70-505.68	162-178
114	1,238.85-1,668.37	185-241

Both malnutrition and over-nutrition influence embryo death rate that can reach 25-30% (BOGDAN, 1999). Both feed infested with moulds (that interact directly) and myco-toxins (that produce food poisoning or sub-toxic conditions) have a negative impact on gestation.

The use in agriculture of more and more insecticides also has a negative impact on animals that feed on treated forage. Acute and chronic food poisoning caused by digestive absorption, respiration, or through the skin of the insecticide and its storing in lipid rich organs and that interfere with enzymatic processes in the body are well-known.

Insecticides based on phosphorus esters are particularly important for sows in gestation, as they are strong inhibitors of choline esterase with accumulation of acetyl-choline at the level of motion ways manifested through convulsive contractions in the smooth and stranded muscles resulting in zygote, embryo, and foetal death.

f) Macro- and micro-climate in the sheds. High temperature plays a very important role in the process of reproduction in both males and females. High temperature delays sexual maturity, decreases gamete viability, and has an unfavourable influence on embryo and foetus development (embryo absorption), experimentally proven by transplanting fecundated eggs to females under thermal stress.

During summer periods with high temperatures, there is a prolongation of the oestrus cycle and a decrease of prolificacy in the Landrace breed. Exchanging the pregnant sows' environment within the same area but in the open air and on a pasture for the whole year has an impact on ovulation, fecundity, and embryo death rate.

In general, macro- and micro-climate conditions have a very important influence on reproduction function in sows. If at present we know optimal micro-climate values ensuring the shed comfort necessary for the biological potential to manifest, pasture exploitation results in variable reproduction results from the point of view of conception rate, prolificacy, and calving interval.

Table 2 shows how reproduction in Landrace sows can be monitored to help identifying the weak points of the farm management and that need special care to achieve economic reproduction under maximum efficiency conditions.

The longer the calving interval, the less calvings per sow. In order to implement a performing farm management, it is necessary to establish a reference standard for the reproduction parameters in the Landrace breed as shown in Table 3.

Table 2

Management factors with impact on reproduction efficiency

Management factors	Very good	Good	Weak
Service period (days)	38-40	40-52	>52
Number of insemination per gestation	1.3-1.5	1.5-1.8	71.8
Animals in oestrus at the first cycle (%)	85-90	75-85	<75
Pregnant diagnosed animals 35 days after insemination	80-85	75-80	<75
Calving interval (days)	152-154	155-156	>166
Primiparous sows calving at the age of 1 (%)	30-33	25-30	<25
Number of calvings per sow per year	2.37-2.40	2.20-2.36	<2.20

Table 3

Reference standards for reproduction parameters in the Landrace swine

Parameter	Very good	Good	Weak
Age at first insemination (mm)	7-8	8-9	>9
Non-return (17±3 days) (%)	8-10	10-15	>15
Abortions (%)	<1	1-2	>2
Piglets per calving in primiparous sows (living heads)	10-11	9.5-10	<9.5
Piglets per calving in sows (living heads)	12-13	10-11	<10
Dead calved piglets (%)	<1	1.5	>1.5

CONCLUSIONS

In order to get maximum of efficiency in reproduction on a pure bred swine farm, each sow should reach a reproduction index of 2.37-2.40 calvings per year over an exploitation period of 6-7 calvings to recover the occasional expenses on male and female reproduction material until puberty.

Reaching remarkable performance cannot be done without observing farm management and developing a reference standard concerning reproduction parameters (calving index, service period, calving interval).

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