THE MANAGEMENT OF BREEDING SOWS ON A FARM FROM MURES COUNTY

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Abstract
The purpose of this study was to identify and verify the effectiveness of breeding sows management, intended to optimize the economic performances and correcting negative factors that influence reproductive parameters of them. The research was made in a farm from Mureş County . In this study were followed 100 animals from lines: Camborough, Hypor Libra, Eurohyb, and PIC. The research was focused on several directions: detecting estrus in sows and gilts; the organization of artificial insemination; pregnancy management; the management of parturition and newborn piglets; pregnancy rate and the prolificacy. The animals were divided in 3 groups, depending on the age and number of previous pregnancies. The average number of piglets born at the PIC line was 9.8, and the average number of weaned piglets was 9.5, with a range of 8.6 piglets (group III) and 10.2 piglets (group II). The average number of products produced by the Camborough line was 9,75, with a minimum of 9,6 piglets (lot III) and a maximum of 9,9 piglets (group II). For weaned piglets the average number was 8.75 with values between 8.3 piglets (group III) and 9.2 piglets (group II). For Hypor Libra line the average number of piglets born was 12.35, with values between 12.3-12.4 piglets. The average number of weaned piglets to this line was 11.75, with a minimum of 11.6 (lot II) and a maximum of 11.9 piglets (group III). The average number of piglets born from the Eurohyb line was 9.55, with a minimum of 7.9 piglets (group I) and a maximum of 11,2 piglets (lot III), and the average number of piglets weaned was 8.85 with a minimum of 7.5 piglets (group I) and a maximum of 10.2 piglets (group III).
Keywords: *management, sows, piglets, breeding.*

Introduction

Productivity depends on reproductive efficiency and is often measured by the number of offspring per breeding animal per unit of time. Reproductive management, in turn, relies on using the resources available to best advantage. Genetic selection of those individuals that will fit best into present production plans is helpful in enhancing productivity. Manipulating the environment or adjusting to it are also helpful [3]. Many advances in genetic selection, nutrition, housing and disease control have been incorporated into modern pork production since the 1950s resulting in highly prolific females and practices and technologies, which significantly increased efficiency of reproduction in the breeding herd [9]. An ovulation rate of 20 is not uncommon in contemporary highly prolific females [5]. Therefore, if one assumes a gestation length of 115 d, a lactation length of 21 d, a weaning-to-estrus interval (WEI) of 5 d, 100% conception rate and zero embryonic and preweaning mortality, sows have the potential to farrow 2.6 times/year and to produce 52 pigs weaned/mated sow/year. However, due to numerous factors, such as season, nutrition, disease, embryo mortality before day 30 of pregnancy and piglet preweaning mortality, the potential of 52 weaned pigs/mated sow/year has not been reached.

Estrus normally lasts 24 to 48 h in gilts and up to 72 h in sows. Approximately 90% of sows express estrus 3–6 d after weaning and sows which are mated at estrus 4–6 d after weaning have greater farrowing rates and litter sizes than sows mated later than 6 d after weaning [10].

Farrowing rates and litter sizes will be lower if insemination occurs more than 24 h before ovulation because sperm live approximately 24 h after insemination and eggs can be fertilized for only 12 h after ovulation [11]. Hyperprolific maternal line females of today commonly have 14–16 piglets born alive and piglet pre-weaning mortality ranges from 11 to 24% predominantly in the first five day of age, therefore, there is renewed interest in attendance and assistance at farrowing [1]. Cervical artificial insemination (CAI) is the predominant breeding method on farms of all sizes [6].

Benefits of cervical artificial insemination and post- cervical artificial insemination are introduction of improved genetics, reduced risk of disease transmission and improved performance of reproductive tasks, which improves time management compared to natural service [4]. Fifty-five percent of farms used the interval from weaning to estrus to time the first artificial insemination, after detection of estrus, 62% of farms timed the first artificial insemination to occur within min or a few hours of estrus, whereas 30% delayed artificial insemination until the next AM or PM period. Seventy-six percent of farms planned for two doses of semen for each sow, whereas only 14% planned for three doses of semen per sow. Post-cervical artificial insemination is practiced on only 6% of farms; 61% having no experience with Post-cervical artificial insemination and 25% having tried it, but not used it since. However, during the past two year, interest in and implementation of Post-cervical artificial insemination has experienced a dramatic increase with a high success rate and may soon become the most prevalent artificial insemination technique [6, 7, 8, 9].

The aim of this study was to identify and verify the effectiveness of breeding sows management, intended to optimize the economic performances and correcting negative factors that influence reproductive parameters in a farm from Mures County.

Materials and method

The research has been carried out between March 2017-January 2018 in a farm from Mures county, and involved 100 sows and gilts of different ages divided in 3 groups: group I consisted of 30 F1 gilts, aged 7-8 months; group II involved 40 F1 sows, aged 28-36 months; group III consisting of 30 F1 sows, aged 12-13 months.

Group I was composed of 20 gilts from the PIC 1050 line and 10 gilts from the Eurohyb line. Regarding the group II 20 sows were from the PIC 1050 line, 10 sows from the Camborough line and 10 sows from the Hypo Libra line. Group 3 was composed of 12 sows from the PIC 1050 line, 6 sows from the Hypo Libra line, 7 sows from the Eurohyb line and 5 sows from the Camborough line.

The animals were monitored until first clinical signs of estrus were detected. Estrus was detected with boar exposure twice a day. Duroc, Pietrain, PIC and Maxter boars were used. Semen was collected twice per week and volume, color and motility were evaluated. The semen was diluted in Merck III extender (Minitube), packaged in 80 ml bottles with 4.0×10^9 spermatozoa. Diluted semen was stored at 16-18 ^{0}C.

For gilts were performed two artificial inseminations at 12 hours interval and for sows three artificial inseminations at 12 hours interval. Females showing signs of the oestrus after 21 days were artificially inseminated again.

Pregnancy was determined at 21 days observing estrus return. All pregnant gilts and sows were kept under observation and 24 hours before parturition were moved in individual boxes.

The following parameters were investigated: number of AI needed for a gestation, pregnancy rate, piglets born per litter – alive and dead, weaned piglets.

Results and Discussion

In case of group I were diagnosed pregnant 50% of the gilts after the first estrus cycle, 36.66 % at the second estrus cycle and 13.04% at the third estrus cycle. In case of group II were pregnant 65.50% at the first estrus cycle, 32.50% at the second and 2.5% at the third estrus cycle. Regarding the distribution in group III was observed that after first estrus cycle were pregnant 46.66% of the sows, 23.33% at the second and 30% at the third estrus cycle. In the present study the conception rate after three artificial inseminations was 100%. The situation for each group is presented in table 1.

Table 1

Situation of pregnancy

	Group I		**Group II**			**Group III**			
Line	**P**	**E**	**P**	**C**	**H**	**P**	**C**	**H**	**E**
Pregnancy after first estrus cycle	9	6	14	7	5	5	2	4	3
Pregnancy after second estrus cycle	9	2	6	3	4	2	1	1	3
Pregnancy after third estrus cycle	2	2	0	0	1	5	2	1	1
P- PIC 1050; E- Eurohyb; C- Camborough; HL- Hypo Libra									

The average number of piglets born at the PIC line was 9.8, and the average number of weaned piglets was 9.5, with a range of 8.6 piglets (group III) and 10.2 piglets (group II). The average number of products produced by the Camborough line was 9,75, with a minimum of 9.6 piglets (group III) and a maximum of 9,9 piglets (group II). For weaned piglets the average number was 8.75 with values between 8.3 piglets (group III) and 9.2 piglets (group II). For Hypor Libra line the average number of piglets produced was 12.35, with a minimum of 12.3 piglets (group III) and a maximum of 12.4 piglets (group II). The average number of piglets weaned to this line was 11.75, with a minimum of 11.6 (group II) and a maximum of 11.9 piglets (group III). The average number of piglets born by sows of the Eurohyb line was 9,55, with a minimum of 7.9 piglets (group I) and a maximum of 11.2 piglets (group III). The average number of weaned piglets was 8.85 with a minimum of 7.5 piglets (group I) and a maximum of 10.2 piglets (group III) (Table 2).

The best results of piglets born was obtained at the line HypoLibra where the average was 12.35, also the best results of weaned piglets was at line HypoLibra 11.75. The values of this study falls within the limits of other studies [4, 6]. The number of artificial inseminations performed in an estrus cycle was two for the gilts and three for the sows, aspect that we found in the literature [10]. The prolificacy of improved breeds is between 10,5-11 [2]. In our study the prolificacy was better in case of HypoLibra line and weaker for the lines PIC 1050, Eurohyb and Camborough.

Table 2

Fertility parameters recorded for the three experimental groups

		No. of AI for a gestation	No. of piglets born alive	No. of piglets born dead	Weaned piglets	Large piglets	Medium piglets	Small piglets
Group I	P	1.2±0.42	9.85±2.73	-	9.7±2.73	156	28	10
	E	1.3±0.57	7.9±3.84	-	7.5±4.19	35	36	4
Group II	P	1.75±0.85	9±3.98	6	8.6±3.87	148	7	6
	C	1.2±0.42	9.6±3.20	7	8.3±2.96	83	4	4
	H	1.1±0.31	12.3±5.37	9	11.9±5.08	102	9	8
Group III	P	1.4±0.69	10.7±3.12	-	10.2±3.01	91	6	5
	C	1.2±0.42	9.9±1.66	-	9.2±1.54	82	4	6
	H	1.2±0.44	12.4±4.03	-	11.6±4.87	49	3	6
	E	1.4±0.54	11.2±1.92	-	10.2±1.64	48	1	3

P- PIC 1050; E- Eurohyb; C- Camborough; HL- Hypo Libra

Conclusions

Research has highlighted the great deficiency in the lack of estrus synchronization, which has led to a small percentage of born and weaned piglets compared to other breeding farms. We recommend the implementation of estrus synchronization in the future, which would increase the prolificacy by up to 30% at a low cost price.

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