



EFFECT OF PHYTOADDITIVES ON SOW REPRODUCTIVE EFFICIENCY

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ABSTRACT

Phytoadditives are characterized as herbal products to use in nutrition to increase the productivity of animals. At present, the really assumed potential of fecundity is 15.0 piglets born alive, 2.4 litters/year, 10% losses and 32.5 piglets per sow/year. The objective of this study was to examine the effect of phytogenic additive in sows feed rations on reproductive efficiency. In control group were 12 sows Large white (between 2nd and 5th farrows) and in experimental group were the same sows as in control group, but they were on the next farrowing (between 3rd and 6th farrows). Sows in experimental group were fed with the same feed ratio, but with phytogenic additive supplementation. We studied in both groups number of all born, live born and weaned piglets in litter. We found out that reproductive efficiency of sows in control group was: 10.17 all born piglets, 8.67 live born piglets, 8.17 weaned piglets. Reproductive efficiency of sows fed with phytogenic additive was: 13.00 all born piglets, 10.67 live born piglets, 10.17 weaned piglets. However we did not find statistically significant effect of the addition of phytogenic additive to the feed on reproductive efficiency of sows between control and experimental group.

Keywords: sow, reproduction, nutrition, phytoadditives

INTRODUCTION

Production parameters in animal breeding are dependent of many factors such as genetic (Trakovická *et al.*, 2006), nutrition (Gálik and Rolinec, 2011; Humer and Schedle, 2012; Majlát, 2012), breeding system and technology (Cheng *et al.*, 2011), health (Petruška *et al.*, 2012; Rolinec *et al.*, 2012; Kanka, 2010) etc. Generally it is difficult to determine the potential of reproduction performance, because there is a continuous dynamic for border of performance. The profitability of pig production considerably depends on the number of born alive and festered piglets. At present, the really assumed potential of fecundity is 15.0 piglets born alive, 2.4 litters/year, 10% losses and 32.5 piglets per sow/year (Wähner and Brüßow, 2009).

Table 1 Reproductive efficiency of sows in different experiments

Authors	Effect of	All born piglets	Live born piglets	Weaned piglets
Holendová and Čechová, (2010)	BT < 0.69cm	9.5 ± 3.5	8.4 ± 3.0	7.9 ± 2.8
	BT 0.69 – 0.85cm	10.3 ± 2.8	9.2 ± 3.1	8.3 ± 2.5
	BT 0.86 – 1.01cm	9.0 ± 3.0	8.4 ± 2.7	7.7 ± 2.6
	BT 1.01cm <	9.4 ± 3.4	8.1 ± 3.0	7.4 ± 2.0
Šprysl <i>et al.</i> , (2010)	Hy (CLWxCL)xH	10.58	9.02	7.95
	Hy (CLWxCL)xD	10.52	9.27	7.63
	Hy (CLxCLW)x(DxBL)	11.75	10.19	8.44
	Hy (CLxCLW)x(BLxH)	10.24	9.37	7.87

Hy – hybrid, BT - backfat thickness, CLW – Czech large white, CL – Czech landrace, D – Duroc, BL – Belgian landrace, H – Hampshire,

Feed additives are products used in animal nutrition in order to improve the quality of feed, performance and animal health (Capcarová and Kolesárová, 2010). Phytoadditives are characterized as herbal products to use in nutrition to increase the productivity of animals. In animal nutrition as phytoadditives used different kinds of herbal and spices: oregano (*Origanum vulgare*) (Hulánková and Bořilová, 2011), majoram (*Majorana hortensis*), dill (*Anethum graveolens*), basil (*Ocimum basilicum*) (Vábková and Neugebauerová, 2011), allspice (*Pimenta dioica*), coriander (*Coriandrum sativum*), cumin (*Carum carvi*) (Mareš *et al.*, 2009), soapbark (*Quillaja saponaria*) (Václavková and Bečková, 2008), wild

strawberries (*Fragaria vesca*), rhubarb (*Rheum officinale*), lemon balm (*Melissa officinalis*), klamath weed (*Hypericum perforatum*) (Kiselova et al., 2011) and also essential oil from anise (*Pimpinella anisum*) and citrus (Gálik et al., 2011). Herbs and their extracts are able to increase efficiency by following ways: increasing of feed intake by improving of taste qualities or dependence creation, improving of immunity as well as by antibacterial coccidiostatic, antihelmintic, antiviral, antiinflammatory on partly antioxidative properties (Mareš et al., 2007) and also with their antiparasitic efficiency (Mägi et al., 2006). The objective of this study was to examine the effect of phytogetic additive in sows feed rations on reproductive efficiency.

MATERIAL AND METHODS

The feeding trial was carried out from March 2011 to December 2011. A total 12 clinically healthy sows were monitored. These Large white sows from Sheep and Pig Farm Žirany (VPP Kolíňany, Slovak University of Agriculture in Nitra) were between 2nd and 6th farrows. All sows received the same mixture of food twice a day (50% in the morning, 50% in the evening), 1.3 kg per 100 kg live weight. Diet contains 17.88% crude protein, 4.96% fat, 4.33% crude fibre, 58.79% nitrogen-free extract and 13.17 MJ.kg⁻¹MEp. In control group were 12 sows (between 2nd and 5th farrows) and in experimental group were the same sows as in control group, but they were on the next farrowing (between 3rd and 6th farrows). Sows in experimental group were fed with the same feed ratio, but with phytogetic additives supplementation. Dose of phytogetic additive in experimental group of sows was 3 g per each sow and day. Phytogetic additive contains a blend of essential oils from oregano, anise and citrus, as well as a prebiotic rich in fructooligosaccharides. Water intake for animals was *ad libitum*. Parturition was watched but observers interfered as little as possible in the farrowing process. We observed the following indicators: all born piglets, live born piglets, weaned piglets. Obtained values had a normal distribution, which is necessarily for the following statistical analysis (Schubertová and Candrák, 2012). The data was analysed using the ANOVA procedure of SAS system 9.1. (SAS Institute Inc.). A P-value of < 0.05 was considered significant.

RESULTS AND DISCUSSION

The need for natural alternatives to antibiotic growth promoters is an important issue in animal production following the European ban of antibiotic growth promoters in 2006. The high production level with still increasing demands as well as production sites that have to fulfil high quality standards at low costs result in high stress levels for the animal and will increase the demand for bioactive elements with effects on health and production (**Klinzig Nielsen, 2008**). In practice sows reproductive efficiency is determined according to number of all, live born and weaned piglets in litter.

Table 2 Results of reproductive efficiency of sows

Group	Order of litter	All born piglets	Live born piglets	Weaned piglets	Losses from live born piglets till weaning (%)
Control n=12	3.5 ± 1.05	10.17 ± 4.79	8.67 ± 5.05	8.17 ± 4.75	5.77
Experimental n=12	4.5 ± 1.05	13.00 ± 2.37	10.67 ± 2.73	10.17 ± 1.94	4.69

P>0.05 - it was not significant difference in the reproduction parameters between control and experimental group

We studied these traits in control group and also in experimental group which consist of the same sows as in control group, but they were on the next farrowing and were fed with feed ratio with phytoadditives supplementation (Table 2). In the experimental group were determined by 27.83% more all born piglets, by 23.07% more live born piglets and by 24.48% more weaned piglets than in control group. The issue of reproduction in pig keeping and breeding constitutes a phase directly influencing the consecutive production stage by providing an appropriate amount of animals. Factors affecting reproductive efficiency of sows are many. Authors analysed different factors influencing reproduction (Table 1). **Kapelanski et al. (2008)** applied diet, which causing more intensive postprandial insulin production has also contributed to the satisfactory results in the scope of the sows breeding performance. They results were 10.76 all born piglets, 0.53 still born piglets and 9.94 weaned piglets. **Bielas et al. (2007)** estimated the effect of insemination of sows and gilts with frozen and liquid semen on reproductive efficiency and they did not found any statistically differences.

They results were in gilts 7.33 to 10.71 all born piglets with 1.00 to 1.50 still born piglets and in sows 9.10 to 12.64 all born piglets with 1.14 to 1.66 still born piglets. **Cebulska et al. (2012)** published selected reproduction performance traits of native breeds in Poland. The results of number of piglets in a litter are: 9.25 Złotnicka spotted, 9.50 White złotnicka and 11.05 Puławska breed. The results of number of piglets aged 21 days are: 8.31 Złotnicka spotted, 8.72 White złotnicka and 10.11 Puławska breed. Our results, all born, live born piglets and weaned piglets are in the range, which are published by the other authors. However, we did not find statistically significant effect of feed supplementation with phytogetic additive on reproductive efficiency of sows (Table 2). This results explained **Opletal et al. (2008)** following. It is apparent that with respect to physiology of booth sexotypes the statement can be made that positive intervention can be carried out at boars, where libido can be increased and the spermiogram profile improved. In the case of sows this possibility is limited – it can be out practically only by increasing the estrogen level (and it is still not certain). When a sow becomes pregnant, it is practically impossible to reach the decrease of embryonic mortality in the period of the so called progesterone shock. Hormonal process of pregnancy is regulated in a very sensitive way, it is strictly consequent and it is very difficult, almost impossible, to intervene into it, for us in a desirable way.

CONCLUSION

We found out that reproductive efficiency of sows in control group was: 10.17 all born piglets, 8.67 live born piglets, with 5.77% losses from live born piglets till weaning. Reproductive efficiency of sows fed with phytogetic additive was: 13.00 all born piglets, 10.67 live born piglets, with 4.69% losses from live born piglets till weaning. However we did not find statistically significant effect of phytogetic additive on reproductive efficiency of sows.

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