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ANALYSIS OF CHEMICAL COMPOSITION IN SOW'S MILK

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Abstract: In this paper, the chemical composition of sow milk from birth to 28 days was analyzed, quantitatively and qualitatively, in order to conclude if there it is possible to intervene in any way in the technology of breeding, that can reduce piglets' morbidity and mortality. Collecting milk from the sow is more difficult than from the cow, and from the seventh day was very difficult, therefore samples from several sows were needed to get enough milk for one determination. From each sample, protein, fat and lactose were determined using standard methods. It was found an increase in protein synthesis by the 14th day, followed by a decrease. The milk analysis revealed relatively higher levels of fat (7.5% vs. 6.5%), lower lactose levels (5% vs. 6%) and similar protein expression (5%), when compared to colostrum.
Keywords: sow, colostrum, determination, sampling, husbandry.

• Introduction

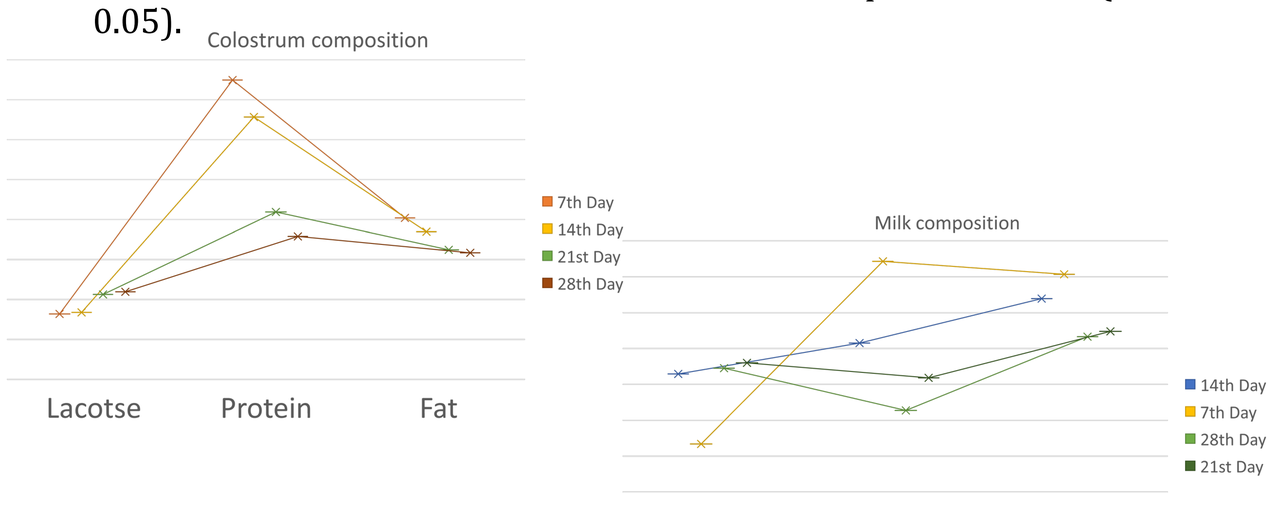
Piglets fed to highly productive sows grow on average around 250 g per day between birth and weaning, but this growth rate is well below their biological potential. It has been known for decades that captive-reared pups can grow over 450 g/day with ad libitum use of milk replacer, and perhaps today's modern genotypes can grow even faster. Evolutionarily speaking, high-fat content of mother's milk is most beneficial for piglets to increase body fat content [10], thereby improving piglet survival. Increasing the concentration of feed protein in sow diets leads to higher concentrations of milk casein and milk protein, but it is unclear what concentration of milk protein is optimal for piglet growth [5]. However, several authors [17, 13, 20] have suggested that the milk protein concentration or milk protein to energy ratio is too low to support maximal growth in piglets with lean genotypes.

• Material and method

Twenty sows (Landrace x Yorkshire) were used in the present study. The sows were housed in individual farrowing crates and were fed a commercial gestation diet throughout pregnancy. Within 12 hours after farrowing, hand milking collected colostrum samples from each sow. Subsequently, milk samples were collected at 24 and 48 hours after farrowing. The samples were collected in sterile containers and stored at -20°C until analysis.The protein, fat, and lactose content of the samples were analyzed using the Kjeldahl method, Gerber method, and Lactostar method, respectively. The results were expressed as percentages (%). Data were analyzed using one-way ANOVA followed by Tukey's multiple comparison test. $P < 0.05$ was considered significant. During the colostral period, the sow accepts the "substitution" the piglet by human hands, but after five days it is very difficult to obtain a quantity of milk which corresponds to an analysis of the addition. 10 milk samples were collected during the colostral period, on the seventh, 14th, 21st and 28th days.In order to obtain a sufficient amount of milk, samples were collected from several sows in the same lactation phase. Protein, fat and lactose were determined from these samples. During the colostral period, since they could be collected more easily, the samples were collected: at farrowing at six o'clock; at 12 hours; at 18 hours and 24 hours postpartum.

• Results and discussions

The results showed that the percentage of protein was significantly higher in colostrum (15.3 ± 1.8%) than in milk at 24 hours (5.9 ± 0.8%) and 48 hours (5.5 ± 0.6%) postpartum ($P < 0.05$). The percentage of fat, on the other hand, was significantly lower in colostrum (3.8 ± 0.6%) than in milk at 24 hours (8.6 ± 1.0%) and 48 hours (7.4 ± 0.8%) postpartum ($P < 0.05$). The percentage of lactose was also significantly higher in colostrum (3.7 ± 0.3%) than in milk at 24 hours (2.6 ± 0.2%) and 48 hours (2.8 ± 0.2%) postpartum ($P < 0.05$). Our results showed that the chemical composition of milk and colostrum in sows varied significantly throughout lactation. Colostrum had higher levels of protein, fat, and immunoglobulins than regular milk [7, 8, 9]. The protein content in colostrum was about 15% on average, while regular milk contained around 5% protein. From the data gathered and compiled, we analysed firstly, just the percentages of protein found in milk and colostrum. It can be seen comparing the percentage from farrowing and at 28 days an extreme decrease (with a mean of 14,98 after farrowing and 4,27 at 28 days. The results showed that the percentage of lactose was significantly higher in colostrum (4.4 ± 0.3%) than in milk (3.2 ± 0.2%) postpartum ($P < 0.05$) (Table 3). There was no significant difference in lactose content between milk samples collected ($P > 0.05$).



• Conclusions

As a general conclusion we can say that the study showed that even though it can be seen a slight difference between the colostrum and normal milk collected, it does not show a significant impact of the colostrum being fed to piglets as quality feed, but the amount that it is given its much more important due to the permeability of the intestine. It can be seen that not the composition of the colostrum is important for the development of the piglets but, the moment when they are fed.

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