



# Antioxidant system characteristics in Saanen goats depending on lactation period

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## Abstract

Dairy goats require attention and high quality feeding during the lactation due to metabolism high intensity. The metabolic rate during different lactation periods is the case is of interest in order to better understanding production physiology in Saanen goats. The aim of this research was to evaluate antioxidant system characteristics in Saanen goats depending on lactation period.

## Materials and methods

The experiment was conducted in the north-western region of Russian Federation, in laboratory of biochemistry and physiology department, FSBEI of Higher Education «SPbSAVM». The experimental group included 30 Saanen goats, 2nd-3rd lactations, selected using matched pairs method. The blood samples were taken 3 times – at the start of the lactation (2 days after parturition), at peak lactation performance (45 days after parturition) and before the interlactation period (4 months after parturition). Control group included 30 non-lactating Saanen goats, same age. The blood samples in control group animal were taken once. The blood levels of lipid peroxygenation markers (malondialdehyde, dienketone and conjugated dienes) and superoxide dismutase and catalase activity were assessed by standard methods. Results presented as mean±standard error of the mean. Student's t-test was used after proving normal distribution. Level of significance is labeled as  $p < 0.05$ .

## References

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## Results

Table 1. Free-radical oxidation intensity in Saanen goats depending on lactation period (M±m)

	Diene conjugates, U	Dienketone, U	Malondialdehyde, umol/l
Start of the lactation (2 days after parturition) (n=30)	0.15±0.01*	0.15±0.01*	6.25±0.30*
Peak lactation performance (45 days after parturition) (n=30)	0.13±0.02*	0.16±0.02*	5.0±0.33*
Before the interlactation period (4 months after parturition) (n=30)	0.08±0.01	0.10±0.03	3.20±0.30
Control group – non-lactating animals (n=30)	0.065±0.01	0.09±0.1	2.75±0.54

\* P < 0.05, comparing average milk producing ability goats

Table 2. Anti-oxidizing enzymes activity in Saanen goats depending on lactation period (M±m)

	Catalase, U	Superoxide dismutase, U/min
Start of the lactation (2 days after parturition) (n=30)	6.38±0.4	25.21±1.3
Peak lactation performance (45 days after parturition) (n=30)	5.45±1.25*	20.5±3.80*
Before the interlactation period (4 months after parturition) (n=30)	2.2±0.75	14.3±1.2
Control group – non-lactating animals (n=30)	2.55±0.5	15.55±2.2

\* P < 0.05, comparing average milk producing ability goats

## Conclusion

After analyzing the received data of antioxidant system characteristics the free radical oxidation highest intensity were revealed at the start of the lactation and at peak lactation performance, which indicates the development of oxidative stress in this periods. Also antioxidant enzymes activity was reduced during the peak lactation performance and remained at the control group level at the start of the lactation. This indicates free radical oxidation processes decompensation during the peak lactation performance. Thus, due to the development of decompensated oxidative stress in high milk producing ability animals during peak lactation, exogenous use of anti-oxidants is recommended.