

Cortisol levels in Mohair fiber: a stress evaluation in Angora goats

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INTRODUCTION & AIM

Hair cortisol concentration (HCC) is a retrospective marker of stress; its quantification is a valuable tool due to the simple, non-invasive sampling method and its representation of prolonged stress periods. Another key attribute of fiber quality is the mean fiber diameter (MFD). We aimed to study HCC levels and MFD variation across two growth periods of Mohair fiber.

METHOD

Fiber samples were collected from 14 goats raised under extensive conditions (EP: extensive period—90 days) and then transitioned to a winter trial with free-range feeding (IP: intensive period—83 days). At the beginning of the IP, fiber was dyed at the base (dye binding). At the end of the IP, dyed fibers were cut and analyzed using OFDA2000 equipment to determine the initial and final MFD, allowing the calculation of the daily rate of diameter change (MFDR, $\mu\text{m}/\text{day}$). Steroid extraction was performed using organic solvents to quantify cortisol levels by high-performance liquid chromatography. Data were analyzed using a paired samples t-test with a 5% significance level.

RESULTS & DISCUSSION

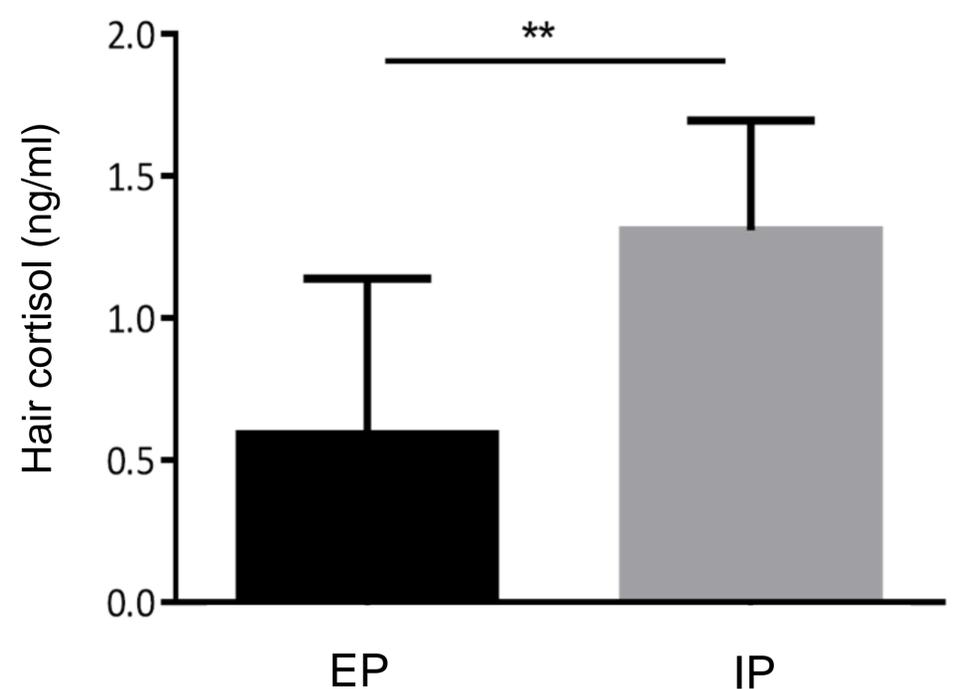


Figure 1. Cortisol concentration in mohair fiber of Angora goats in the extensive period (EP) and in the intensive period (IP). **indicates significant differences, t test, $P=0.0025$.

The cortisol concentration in the EP was higher than in the IP (Figure 1). During the EP the animals had a lower MFDR ($-0.008 \pm 0.004 \mu\text{m}/\text{day}$) than during the IP ($0.015 \pm 0.004 \mu\text{m}/\text{day}$) ($P<0.01$). These results would indicate a greater availability of nutrients at the follicular level during AP that is observed in the increase in diameter and a reduction in hair cortisol. Data were analyzed with a paired samples t test with an error of 5%.

CONCLUSION

These findings suggest greater nutrient availability at the follicular level during the IP, resulting in increased MFD and reduced HCC. Despite being kept in a smaller space with reduced mobility and higher stocking density during winter, access to shelter, food, and water in both quantity and quality contributed to reduced cortisol levels and a higher MFDR, indicating improved animal welfare.