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Università degli Studi di Messina
Dipartimento di Scienze Veterinarie

Istituto Zooprofilattico Sperimentale della Sicilia
“A. Mirri”

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SELECTION OF YOUNG EWE LAMBS ACCORDING TO THEIR ANTRAL FOLLICULAR COUNT: RESPONSE TO EXOGENOUS HORMONAL STIMULATION AND FERTILITY AT FIRST BREEDING SEASON.

Torres-Rovira L1, Manca ME1, Gonzalez-Bulnes A2, Spezzigu A3, Piu P1, Gallus M4, Succu S1, Chelucci S1, Leoni G1, Berlinguer F1, Naitana S1.

1Department of Veterinary Medicine, University of Sassari, Sassari, Italy; 2Department of Animal Reproduction, INIA, Madrid, Spain; 3Embryo Sardegna, Technology, Reproduction, and Fertility, Perfugas, Sassari, Italy; 4Department of Animal Production, AGRIS Sardegna, Bonassai, Sassari, Italy.

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Introduction: Anti-Mullerian Hormone (AMH), Antral Follicular Count (AFC) and the response to exogenous hormonal stimulation have been used, in adults, as suitable markers to determine the ovarian reserve (1-4), to predict oocyte quality (5,6) and a wide variety of fertility indices (6-9).

This investigation aims to evaluate if animals selected according to their High or Low AFC at an early prepubertal age show different responses, in the number of follicles and AMH plasma levels, to exogenous hormonal stimulation; to verify whether differences are maintained over time until puberty; and to observe possible variations on fertility at first breeding season.

Material and Methods: Forty eight Sarda ewe lambs, with a mean age of 49.77 ± 1.15 days-old, were classified according to the number of follicles ≥ 2 mm in diameter present in their ovaries into Low AFC group (≤15 follicles) and High AFC group (≥ 30 follicles). The number of ≥ 2 mm follicles was determined by transrectal ultrasonography with a real-time B-mode scanner fitted with a 7.5 MHz rigid laparoscopic transducer (10). At 1.5 and 6.5 month-old, one-shot intramuscular dose of 60 mg FSH was administered to all animals and the number of ≥ 2 mm follicles was recorded before and 24 hours after treatment along with blood sample gathering. Plasma AMH concentration was analyzed with a commercial ELISA kit. Fertility at first reproductive season was assessed by the number of animals that remained pregnant. Rams were introduced into the ewe flock from August to the end of September, then, pregnancy diagnosis was performed using transrectal ultrasonography.

Results: At 1.5 month of age High AFC group had a significant higher number of 2mm, 3mm and total follicles (≥ 2 mm) than Low AFC group. This difference, remained after FSH administration and even became significant for ≥4mm follicles. Follicles grew to larger sizes and follicular recruitment increased for both groups. At 6.5 month of age the High AFC group had a significantly higher number of ≥4mm follicles. After exogenous FSH stimulation, High AFC group had higher number of follicles in each category. AMH plasma levels at 1.5 month-old were significantly higher in the High AFC group before (1.766 ng/ml ± 0.143 for High AFC group vs 0.357 ± 0.143 for Low AFC group) and after ovarian stimulation (1.217 ng/ml ± 0.143 for High AFC group vs 0.239 ng/ml ± 0.143 for Low AFC group; p<0.05). Circulating AMH was positively correlated to total number of follicles ≥ 2 mm before (r=0.65) and after (r=0.82; p<0.0001) treatment. Also, initial AMH plasmatic levels were positively correlated to the number of follicles grown per each follicular category after FSH administration (2mm r=0.72, 3mm r=0.83, ≥ 4mm r=0.39, total r=0.85; p<0.01). At 6.5 month of age animals had undetectable levels of AMH. Regarding fertility data, 60.87% of the High AFC ewes remained pregnant at first breeding season versus 33.33% of the Low AFC ewes (p<0.05).

Conclusions: Selection of young ewe lambs with high versus low AFC by ovarian ultrasonography can improve fertility at first breeding season. Although obvious differences in AFC tend to disappear with aging
during the prepubertal period, ovarian response to exogenous stimulation remains higher in animals with high AFC.

References: