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Eliel González García, Didier Foulquie, Francois Bocquier, Dominique Francois, Dominique Hazard. Growth rates of females from a Romane sheep breed flock reared in rangelands and effects of an early or late first mating regime on their offspring.. ADSA-ASAS Joint Annual Meeting of the American Society of Animal Science, Jul 2015, Orlando, United States. hal-02739626

**HAL Id: hal-02739626**

**<https://hal.inrae.fr/hal-02739626>**

Submitted on 2 Jun 2020

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## Small Ruminant III

**W473 Effects of the level of fish oil in the diet on lamb performance, ruminal fermentation and leptin gene expression.** Pedro Hernandez<sup>1</sup>, German Mendoza\*<sup>2</sup>, Nallely Sanchez<sup>2</sup>, Jose Martinez<sup>2</sup>, and Fernando Plata<sup>2</sup>, <sup>1</sup>Universidad Autonoma del Estado de Mexico, Amecameca, Mexico, Mexico, <sup>2</sup>Universidad Autonoma Metropolitana Unidad Xochimilco, Mexico, D.F., Mexico.

The objective of this study was to evaluate the effects of fish oil on lamb performance, carcass yield, ruminal fermentation, and leptin gene expression. Thirty-two lambs (24.10 kg initial BW, Katahdin × Pelibuey) were used in a completely randomized design. Dietary treatments were: 1) 0 fish oil and 30% corn (DM), 2) 1% fish oil and 25% corn, fish oil substituted for corn (DM), 3) 2% fish oil and 20.5% corn (DM), and 4) 3% fish oil and 17% corn (DM). The lambs were weighed on consecutive days at the beginning (d 0 and 1) and at the end (d 55 and 56) of the trial. Ruminal fluid samples were collected on d 56 to evaluate the ruminal fermentation pattern. The lambs were slaughtered on d 56; the perirenal adipose tissue samples were collected, and the carcass yields were recorded. The VFA, ammonia N and leptin mRNA expression were not affected ( $P > 0.05$ ) by the dietary treatments. However, the DMI, ADG, final BW and the hot carcass yield (HCY) showed linear or quadratic responses ( $P < 0.05$ ) as fish oil was increased in the ration; the estimated optimal responses were obtained with fish oil levels of 1.16% for the final BW, 1.03% for the HCY, 1.12% for the ADG, and 0.78% for the DMI. Additionally, the feed efficiency and the back fat showed a quadratic response ( $P < 0.05$ ) as fish oil was increased in the diet; the estimated optimal responses were obtained with fish oil levels of 1.4% for feed efficiency and 1.6% for back fat. Increasing fish oil in the diet did not have a negative impact on ruminal fermentation or leptin mRNA expression; however, levels of 1% fish oil improved lamb performance and allowed for a reduction in the amount of grains in the rations.

**Key Words:** finishing lamb, fish oil, leptin mRNA

**W474 Growth rates of females from a Romane sheep breed flock reared in rangelands and effects of an early or late first mating regime on their offspring.** Eliel González-García\*<sup>1</sup>, Didier Foulquié<sup>2</sup>, François Bocquier<sup>1</sup>, Dominique François<sup>3</sup>, and Dominique Hazard<sup>3</sup>, <sup>1</sup>INRA UMR Systèmes d'élevage Méditerranéens et Tropicaux (SELMET), Montpellier Cedex 1, France, <sup>2</sup>INRA UE0321, Domaine de La Fage, Roquefort-sur-Soulzon, France, <sup>3</sup>INRA UMR1388 Génétique, Physiologie et Systèmes d'Élevage (GenPhySE), Castanet-Tolosan Cedex, France.

Benefits in lifetime production of the ewe is often determined by the particular characteristics of the growth during the first stages of their life, including the related decision of the age at first mating. The objective of this work was to characterize the growth rates of the young female (from birth to first mating) from the Romane sheep breed, in a flock reared under the Mediterranean rangelands conditions of France. The effects of 2 contrasted first mating regimens (Early; 7 mo vs. Late; 19 mo old) on the individual growth rate of the ewe lamb and their first offspring were also evaluated. A database was built based on historical data that were extracted from the INRA database (GEEDOC). Data from 1359 females born during the period 2002–2012 were collected, processed and interpreted using SAS (9.3). From the total, 762 and 597 females were submitted to the Early or Late regimen, respectively. The effects of the litter size at their birth (singletons; SING vs. multiple; TWIN) and the age of their dams at birth (primiparous, PRIM vs. multiparous,

MULT) were considered. The growth curves were built for both population (Early;  $39.7 \pm 0.07$  kg and Late;  $50.6 \pm 0.04$  kg BW at first mating) of ewes lambs. Significant interactions of the litter size at birth and the dam's parity were found for BW at birth and BW at weaning. Overall, the ewes lambs born from MULT × SING and PRIM × TWIN dams showed the highest ( $4.7 \pm 0.03$  and  $26.2 \pm 0.15$  kg) and lowest ( $3.3 \pm 0.01$  and  $22.5 \pm 0.09$  kg) BW at birth and weaning, respectively. Even if submitting the ewes lambs from the actual flock to the Late regimen constituted a change on the reproductive management policy of the farm (from 2010), data showed that females submitted to Late corresponded to those having a weaker growth from birth to weaning. When analyzing the growth traits of their first offspring, the first litter size ( $1.8 \pm 0.01$  vs.  $2.1 \pm 0.01$  lambs/lambing) and its total weight ( $6.2 \pm 0.03$  vs.  $7.4 \pm 0.02$  kg) were different ( $P < 0.0001$ ) for ewes submitted to the early or late regimen, respectively. Other related carry over effects during the whole productive life of this females' population and their offspring are currently being analyzed.

**Key Words:** growth rate, Romane female lamb, mating regimen

**W475 Effects of maternal lines and mating systems on susceptibility to parasitism in a pasture-lambing, low-input production system.** Shuna A. Jones\*<sup>1</sup>, Chadwick C. Chase<sup>1</sup>, Michael Heaton<sup>1</sup>, Karen K. Shuck<sup>2</sup>, Kreg Leymaster<sup>1</sup>, and John Keele<sup>1</sup>, <sup>1</sup>US Meat Animal Research Center, Clay Center, NE, <sup>2</sup>Great Plains Veterinary Educational Center, Clay Center, NE.

Internal parasites are a concern for industry as they negatively affect growth, survival, and reproduction. The objective was to evaluate the susceptibility of maternal lines to parasite infection, with the goal of developing genetic tests for this trait in US sheep. Purebred and Texel-sired lambs were born to Polypay, Katahdin, and Easycare (1/2 Romanov, 1/4 Katahdin, 1/4 White Dorper) ewes. Lambs were born on one of four 10-acre pastures, in a low-input system, 391 lambs were weaned at 70 d of age. Variation was accounted for by having all combinations of maternal lines and mating systems in each pasture. At weaning, a fecal sample was collected from individual lambs and the McMaster fecal egg count test (FEC) was performed on each sample. Data from 282 lambs were analyzed. For genetic evaluation, parentage was determined by allelic exclusion with genotype data from an international panel of 109 parentage SNPs. Data,  $\log(\text{FEC} + 1)$ , were analyzed using a mixed animal model with maternal line, mating system, maternal line × mating system, sex, and pasture as fixed effects. Variance components for additive genetic and environmental effects were estimated by REML using the iterative MIVQUE algorithm. Variance component estimates converged at positive values ensuring that the estimates were REML. Heritability was calculated as the additive genetic variance divided by the phenotypic variance after adjustment for fixed effects. The pasture effect for  $\log(\text{FEC} + 1)$  was highly significant ( $P = 9.38 \times 10^{-16}$ ). Mean  $\log(\text{FEC} + 1)$  of the 4 pastures were 2.66, 3.29, 3.90, and  $2.93 \pm 0.12$ , and the corresponding median FEC (back-transformed from log-normal distribution) were 454, 1944, 7927, and 845 eggs/g. However, breed cross and sex were not significant, with P values of 0.99 and 0.49, respectively. The heritability estimate was  $0.28 \pm 0.17$  which is moderate and significantly different from 0 ( $P = 0.0025$ ) based on the restricted likelihood ratio test. These results indicate that the fecal