



# Lamb meat quality is not affected by the level of maternal nutrition between day 30 and day 80 of pregnancy in sheep

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## Introduction

Maternal nutrition between day 30 and day 80 of pregnancy alter birth weight and postnatal muscle growth and development resulting in altered muscle fiber types in *Semitendinosus* (ST) muscle in sheep (Kuran et al. 2007, 2008).

## Objective

to investigate whether level of maternal nutrition between day 30 and day 80 of pregnancy in sheep has any effect on lamb meat quality.

## Materials and Methods

- ✓ Karayaka breed ewes
- ✓ Three treatments groups;
  - Daily requirement for maintenance (C; control, n=16)
  - Overnutrition (ON; 1.75×C, n= 17)
  - Undernutrition (UN; 0.5×C, n=29)

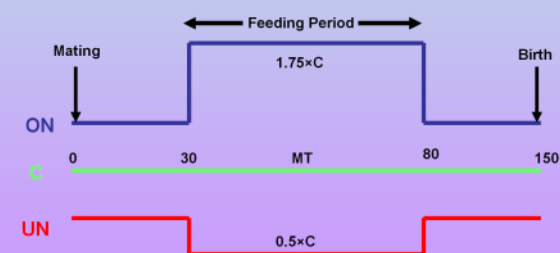


Fig. 1 Pregnancy and feeding period of experimental sheep

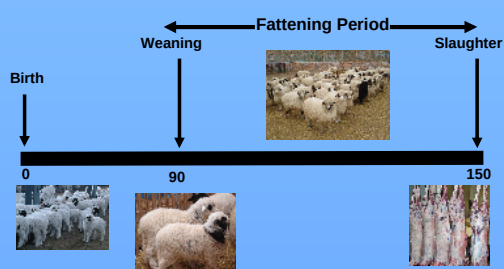


Fig. 2 Weaning and fattening period of experimental lambs

## Results

Maternal nutrition level influences lamb birth weight and muscle fiber type in *Semitendinosus* (ST) muscle in sheep. However, there were no significant differences between treatment groups in terms of meat quality parameters investigated.

## Conclusion

These results indicate that although the levels of nutrition during pregnancy in sheep alter lamb birth weight and skeletal muscle growth and development, lamb meat quality is not affected.

**Table 1** The pH value, colour characteristics, drip loss, cooking loss and shear force of muscles of lambs from Karayaka ewes fed at different levels from d 30 to 80 of pregnancy

| Traits                            | Muscle | Treatment group |      |      | SEM  |
|-----------------------------------|--------|-----------------|------|------|------|
|                                   |        | ON              | C    | UN   |      |
| pH                                |        |                 |      |      |      |
| 1 h                               | LD     | 6.6             | 6.4  | 6.6  | 0.07 |
|                                   | ST     | 5.6             | 5.6  | 5.7  | 0.03 |
| 24 h                              | LD     | 6.7             | 6.6  | 6.6  | 0.05 |
|                                   | ST     | 5.6             | 5.6  | 5.6  | 0.02 |
| Lightness (L*)                    |        |                 |      |      |      |
| 1 h                               | LD     | 34.5            | 34.4 | 34.9 | 0.56 |
|                                   | ST     | 41.4            | 41.2 | 41.7 | 0.93 |
| 24 h                              | LD     | 32.2            | 32.2 | 33.0 | 0.41 |
|                                   | ST     | 39.0            | 39.8 | 39.1 | 0.82 |
| Redness (a*)                      |        |                 |      |      |      |
| 1 h                               | LD     | 18.1            | 18.1 | 18.1 | 0.37 |
|                                   | ST     | 19.9            | 19.6 | 19.7 | 0.41 |
| 24 h                              | LD     | 19.9            | 19.2 | 19.5 | 0.34 |
|                                   | ST     | 20.0            | 20.2 | 19.6 | 0.32 |
| Yellowness (b*)                   |        |                 |      |      |      |
| 1 h                               | LD     | 4.7             | 4.3  | 4.2  | 0.27 |
|                                   | ST     | 6.6             | 6.5  | 6.4  | 0.41 |
| 24 h                              | LD     | 5.2             | 4.8  | 5.0  | 0.24 |
|                                   | ST     | 6.7             | 6.9  | 6.5  | 0.27 |
| Drip loss (%)                     |        |                 |      |      |      |
| 3 d                               | LD     | 8.7             | 8.0  | 9.1  | 0.74 |
|                                   | ST     | 12.4            | 10.5 | 11.4 | 0.53 |
| 7 d                               | LD     | 8.7             | 7.9  | 9.5  | 0.62 |
|                                   | ST     | 12.6            | 11.3 | 12.3 | 0.73 |
| Cooking loss (%)                  |        |                 |      |      |      |
| LD                                | LD     | 23.5            | 23.5 | 23.7 | 1.24 |
|                                   | ST     | 22.0            | 22.4 | 21.0 | 1.21 |
| Shear force (kg/cm <sup>2</sup> ) | LD     | 3.4             | 3.7  | 3.7  | 0.12 |
|                                   | ST     | 4.3             | 4.5  | 4.3  | 0.20 |

**Table 2** Chemical composition of muscles of lambs from Karayaka ewes fed at different levels from d 30 to 80 of pregnancy (% on dry matter)

| Traits             | Muscle | Treatment group |      |      | SEM  |
|--------------------|--------|-----------------|------|------|------|
|                    |        | ON              | C    | UN   |      |
| Dry matter         | LD     | 25.3            | 25.0 | 24.8 | 0.35 |
|                    | ST     | 24.5            | 24.3 | 24.1 | 0.22 |
| Ash                | LD     | 1.09            | 1.09 | 1.10 | 0.46 |
|                    | ST     | 1.08            | 1.10 | 1.09 | 0.35 |
| Total Protein      | LD     | 17.7            | 20.8 | 20.6 | 0.66 |
|                    | ST     | 17.5            | 20.5 | 20.4 | 0.62 |
| Intra muscular fat | LD     | 2.5             | 2.6  | 3.0  | 0.45 |
|                    | ST     | 2.0             | 2.1  | 2.3  | 0.41 |

## References

1. Kuran, M., Sen, U., Sirin, E., Aksoy, Y., Kilinc, K., and Ulutas, Z. 2007. 58th Annual Meeting of EAAP, 13:210.
2. Kuran, M., Sen, U., Sirin, E., Aksoy, Y. 2008. 59th Annual Meeting of EAAP, 14:155.