



Reflexos da mistura de óleos de orégano, de sálvia e de pimenta malagueta no comportamento ingestivo e ganho de peso de ovinos¹

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Resumo: Objetivou-se avaliar o desempenho de cordeiros submetidos a diferentes níveis de suplementação com óleos essenciais. Foram utilizados 40 cordeiros machos não castrados, abatidos aos 32 kg de peso vivo e distribuídos em delineamento experimental inteiramente casualizado. A dieta fornecida apresentava a proporção volumoso/concentrado de 50:50. A mistura de óleos essenciais foi fornecida oralmente em cápsulas para os animais. Os tratamentos foram constituídos de cinco diferentes níveis de mistura de óleos essenciais (MOE) de orégano (*Origanum vulgare*), sálvia (*Salvia officinalis L.*) e pimenta malagueta (*Capsicum frutescens*): 0mg; 50mg; 100mg; 150mg e 200mg. A suplementação com a mistura de óleos essenciais buscou melhorar a eficiência energética e proteica, através da manipulação ruminal, aumentando a quantidade de proteína digerida no intestino e a menor perda via produção de metano e amônia. A mistura de iguais proporções dos óleos essenciais, aos níveis de suplementação de até 200mg por dia, não teve influência significativa (<0,05) para o ganho médio de peso, tempo em confinamento, consumo de matéria seca ou conversão alimentar. Tais resultados sugerem a realização de novos trabalhos para experimentar outras composições e outros níveis de inclusão de misturas de óleos essenciais na dieta de cordeiros.

Palavras-chave: consumo alimentar, cordeiros, desempenho, texel

Reflections of mixture of oregano oil, sage and chili pepper on feeding behavior and sheep weight gain

Abstract: The objective of this study was to evaluate the performance of lambs subjected to different supplementation levels with essential oils. Forty (40) uncastrated male lambs, were slaughtered with 32 kg of live weight and distributed in a completely randomized design. The diet supplied had a roughage:concentrate ratio of 50:50. The mixture of essential oils was given orally as capsules to the animals. The treatments consisted of five different levels of essential oils mixture (MOE) of oregano (*Origanum vulgare*), salvia (*Salvia officinalis L.*) and chili pepper (*Capsicum frutescens*): 0mg; 50mg; 100mg; 150mg and 200mg. Supplementation with the mixture of essential oils improved the energy and protein efficiency by rumen manipulation, increasing the amount of protein digested in the intestine and a lower loss via the production of methane and ammonia. The mixture of equal proportions of essential oils, into supplementation levels up to 200mg a day, had no significant influence ($p < 0.05$) for the average weight gain, confinement time, dry matter intake and feed conversion. These results suggested the requirement of new studies trying to include other compositions and levels of mixtures of essential oils in the diet of lambs.

Keywords: food intake, lambs, performance, texel

Introduction

The sheep industry is developed in almost all over the world, designed for a wide range of economic exploitation. In Rio Grande do Sul, meat has become the main product of the exploitation of sheep wool from the crisis in the decade of 80. The state is the main producer in Brazil and its industry explores the sheep meat (lamb) market to the center of the country, benefiting from the growing demand for lamb and alternative structuring of a product value chain (Viana et. al., 2013).

In this scenario, sheep meat, produced from young animals, it is the one with greater acceptance by the market of large urban centers. The use of the containment system may be one capable of meeting these needs alternatives. Such a system can provide the correct balance of animal diets, playing an improvement of the productive and economic efficiency of the production system. So, get up quickly young animals ready for slaughter (Cañeque & Sañudo, 2005). Therefore, they seek the use of technologies capable to improve the efficiency and



economic operation of lambs. In this sense, the use of alternative methods to favorably alter the ruminal metabolism, improve feed efficiency and animal productivity, has been a constant between ruminant researchers.

Plant extracts contain secondary metabolites, such as essential oils (EO), which have special properties that make them potential alternatives to increase in performance and improvement in the quality of sheep carcasses (Benchaar et al., 2008). These compounds have been shown to modulate rumen fermentation and improve the utilization of nutrients in ruminants (Fandiño et al., 2008).

Based on these assumptions, this study aimed to consider animal performance of lambs supplemented with a mixture of essential oils, by assessing the average daily weight gain, final body weight, days in confinement, average consumption of green matter, average consumption of dry matter, total dry matter intake and feed conversion.

Material e Methods

The experiment was conducted in the Teaching Laboratory, Research and IFFarroupilha the Sheep Production - campus Alegrete, Rio Grande do Sul state, during the period from November 2011 to January 2012. Forty non-castrated males of Texel breed, which after weaning at 60 days, were completed in confinement in individual stalls, divided into five treatments and eight repetitions each, randomly defined, being slaughtered at 32 kg live weight.

The diet fed to lambs consisted of corn silage and concentrate (soybean meal, ground corn and limestone), at 50:50, the animals being hand fed twice daily. Every day, before the morning feeding, they were removed and weighed leftovers to food supply adjustment and to make it possible to obtain individual consumption. The amount offered was adjusted to keep the leftover about 10% of the total offered. To estimate average daily gain and monitoring scope of the target slaughter weight, lambs were weighed at the beginning of the experiment and every interval of seven days. Supplementation of capsules containing the mixture of essential oils was orally twice a day, coinciding with the feeding periods. The treatments consisted of different levels of the mixture of essential oils (MOE) oregano (*Origanum vulgare*), sage (*Salvia officinalis L.*) and chili pepper (*Capsicum frutescens*) the following provision: Group 1 - negative control without supplementation MOE; Group 2 - 50mg EO mixture; Group 3 - 100mg of EO mixture; Group 4 - 150mg of EO mixture; Group 5 - 200 mg of EO mixture. The slaughter was carried out at the slaughterhouse of the institution in accordance with the provisions of Regulation of Industrial and Sanitary Inspection of Animal Products - RIISPOA.

It adopted a completely randomized design and the data of each variable for analysis by the SAS System® software (SAS Inst. Inc., Cary, NC) at a significance level of 5%.

Results and Discussion

The results obtained for the performance characteristics and food consumption are shown in Table 1. No significant effect (<0.05) levels of essential oils was observed for the average weight gain in feedlot time, dry matter intake or conversion Food between treatments. The values obtained are in accordance with those presented by Cañeque & Sañudo (2005).

Table 1. Average daily gain weight, number of days in confinement, dry matter intake of lambs supplemented with mixture of essential oils.

Variable/Treat.	0mg	50mg	100mg	150mg	200mg	F	P>F	CV (%)
PVI (Kg)	19,88	18,34	19,1	18,68	18,79	0,64	0,188	5,78
PVF (Kg)	31,9	32,21	31,91	30,94	31,51	1,22	0,317	3,95
GMD (g)	273,08	289,23	289,01	291,09	301,68	0,98	0,289	12,43
DConf	61,1	61,5	60,5	59,6	61,3	0,45	0,608	18,43
CMV (Kg)	137,79	133,47	141,69	134,28	139,68	0,53	0,137	16,43
CMS (Kg)	57,455	62,106	53,428	50,574	53,514	0,48	0,554	15,93
CMST (Kg)	435,23	440,41	427,43	404,77	428,11	0,51	0,427	15,23
CA	4,77	4,47	4,17	4,12	4,2	0,68	0,433	8,45

PVI: initial body weight. PVF: final body weight. ADG: average daily weight gain. Dconf: days in confinement. CMV: Average consumption of green matter. CMS: Average consumption of dry matter per animal during the trial period. CMST: Consumption total dry matter from animals to trial CV: feed conversion.



One of the hypotheses of work credited to the mixture of essential oils (EO) have the potential to improve rumen efficiency of use of nutrients, thus providing quantitative and qualitative increases the carcasses of lambs. For this purpose, essential oils would be the food cost reduction tool, improving animal performance and reduction of environmental pollution because, by changing the ruminal metabolism aspect, incidentally, publication object by Mohammed et al. (2004), which corroborate the benefits of supplementation, allowing greater ruminal microbial protein synthesis, improved digestibility of food and increased production of volatile fatty acids.

Supplementation with the mixture of essential oils sought to improve energy efficiency and protein by rumen manipulation increasing the amount of protein digested in the intestine and the lower loss via production of methane and ammonia. Finally, the confluence of these activities could translate into higher productivity gains to sheep. However, no effect of essential oil blend levels used on performance estimates. These results demonstrate insufficient rumen manipulation of these variables, although other authors suggest significant increases in animal performance when they are used.

Conclusions

A mixture of equal proportions of essential oils of oregano, sage and chilli pepper, the levels of supplementation to 200 mg for about 60 days, did not allow the lambs of Texel, quantitative increases in weight characteristics, when confined to weaning slaughter at 32 kg live weight. There were also no significant differences in the animal efficiency gains based on the average consumption of green matter, dry matter feed conversion. These results suggest the need for new research to try other compositions and other levels of inclusion of mixtures of essential oils in the diet of lambs.

References

- BENCHAAR, C.; CALSAMIGLIA, S.; CHAVES, A. V.; FRASER, G. R.; COLOMBATTO, D.; MCALLISTER, T. A.; BEAUCHEMIN, K. A. A review of plant derived essential oils in ruminant nutrition and production. **Animal Feed Science and Technology**, n. 145, p. 209-228, 2008.
- CAÑEQUE, V.; SAÑUDO, C. **Estandarización de las metodologías para evaluar la calidad del producto (animal vivo, canal, carne y grasa) en los ruminantes**. Madri: INIA, 2005. 448p. (Serie Ganadera, 3).
- FANDIÑO, I.; CALSAMIGLIA, S.; FERRET, A.; BLANCH, M. Anise and capsicum as alternative to monensin to modify rumen fermentation in beef heifers fed a high concentrate diet. **Animal Feed Science and Technology**, v. 145, n.1, p. 409-417, 2008.
- MOHAMMED, N.; AJISAKA, N.; LILA, Z. A.; MIKUNI, K.; HARA, K.; KANDA, S.; ITABASHI, H. Effect of Japanese horseradish oil on methane production and ruminal fermentation in vitro and in steers. **Journal Animal Science**, n. 82, p.1839–1846, 2004.
- SIMITZIS, P. E.; DELIGEORGIS, S. G.; BIZELIS, J. A. et al. Effect of dietary oregano oil supplementation on lamb meat characteristics. **Meat Science**, v. 79, p. 217-223, 2008.
- VIANA, J. G. A.; REVILLION, J. P. P.; SILVEIRA, V. C. P. Alternativa de estruturação da cadeia de valor da ovinocultura no Rio Grande do Sul. **Revista Brasileira de Gestão e Desenvolvimento Regional**, Taubaté, v. 9, n. 1, p. 187-210, jan./mar. 2013.