Effect of vegetal extracts on coccidiosis in fattening lambs fed with concentrate

Le Scouarnec J., Benzoni G., Guitard J.P., Marzin D., Guyonvarch A.

in

Chentouf M. (ed.), López-Francos A. (ed.), Bengoumi M. (ed.), Gabiña D. (ed.). Technology creation and transfer in small ruminants: roles of research, development services and farmer associations

Zaragoza : CIHEAM / INRAM / FAO
Options Méditerranéennes : Série A. Séminaires Méditerranéens; n. 108

2014
pages 81-84

Effect of vegetal extracts on coccidiosis in fattening lambs fed with concentrate

J. Le Scouarnec[1], G. Benzoni[1], J.P. Guitard[2], D. Marzin[3] and A. Guyonvarch[1]

[1]In Vivo NSA, Talhouët 56 250 Saint-Nolff (France)
[2]Lycée Professionnel Agricole La Cazotte, Route de Bournac, 12 400 Saint-Affrique (France)
[3]Neovia, Talhouët, 56250 Saint Nolff (France)

Abstract. Coccidiosis is an important pathology for sheep, causing important economic losses. Medicated solutions are currently used but increase of coccidian resistance and demand for natural products from consumers is conducting to development of alternative solutions. A trial was conducted on four groups of 30 Lacaune lambs to assess the activity of a mix of plant extracts, commercially named Oilis, on the control of coccidiosis. It was compared to a negative control, to decoquinate (30 mg/kg of concentrate feed) and to another phytogenic product. Animals were followed from weaning (28 days of age) to slaughtering. All evaluated products were incorporated in the concentrate feed that was offered *ad libitum*, only completed by straw. Growth performances were evaluated by individual weighing every three weeks. Oocysts of coccidia were sampled in faeces and counted using Mac Master Cell at 28, 55, 76 and 97 days of age. Oilis improved growth on global period ($p<0.05$), particularly compared to decoquinate (+4.9%) and negative control (+8.3%). It enabled also the most important reduction of oocysts excretion at peak (-62.6%).This trial confirms the potency of some natural products as alternative to chemoprevention of coccidiosis in sheep.

Keywords. Coccidiosis – Lamb – Growth – Excretion.

Effet d'extraits végétaux sur la coccidiose chez des agneaux d'engraissement nourris avec du concentré

Résumé. *La coccidiose est une pathologie importante pour les ovins, entraînant des pertes économiques importantes. Des solutions médicamenteuses sont actuellement utilisées, mais l'augmentation de la résistance aux coccidies et la demande croissante en produits naturels par les consommateurs pousse au développement de solutions alternatives. Une étude a été menée sur quatre groupes de 30 agneaux Lacaune pour évaluer l'activité d'un mélange d'extraits de plantes, commercialement appelé Oilis, sur la lutte contre la coccidiose. Il a été comparé à un témoin négatif, au décoquinate (30 mg/kg d'aliment concentré) et à un autre produit de phytothérapie. Les animaux ont été suivis à partir du sevrage (28 jours) jusqu'à l'abattage. Tous les produits évalués ont été incorporées dans l'aliment concentré, offert ad libitum, et complété par de la paille. Une pesée individuelle a été réalisée toutes les trois semaines. L'excrétion d'oocystes de coccidies dans les fèces a été réalisée à 28, 55, 76 et 97 jours d'âge par comptage sur cellule de Mac Master. Oilis a permis une amélioration de croissance sur la période globale ($p <0,05$), en particulier par rapport au décoquinate (+4,9%) et au contrôle négatif (+8,3%). Il a permis également la réduction plus importante de l'excrétion d'oocystes au pic (-62.6%). Cette étude confirme l'efficacité de certains produits naturels comme alternative aux solutions médicamenteuses dans la prévention de la coccidiose.*

Mots-clés. *Coccidiose – Agneau – Croissance – Excrétion*.

I – Introduction

Coccidiosis is an important pathology for sheep, causing important economic losses (Chartier, 2012). Medicated solutions are currently used but increase of coccidian resistance and demand for natural products from consumers is conducting to development of alternative solutions. Promising results were obtained with a mix of plant extracts, commercially named Oilis, on the control of coccidiosis of young kid goats (Le Scouarnec *et al.*, 2012). They needed to be confirmed with fattening lambs.

II – Material and methods

1. Apparatus, diet and experimental procedure

A trial was conducted on four groups of 30 Lacaune lambs to assess the activity of a mix of plant extracts, Oilis used at 2 kg/t of concentrate, on the control of coccidiosis. It was compared to a negative control, to decoquinate (30 g/t of concentrate) as anti-coccidian chemical molecule commonly used in prevention (= positive control) and to a competitor alternative (based also on vegetal extracts).

Lambs were weaned at the age of 28 days and allocated to 4 batches of 30 (25 males and 5 females). They were housed in a fattening sheepfold, on straw. Allocation took into account the farming method, their sex, weight, age and average daily gain during lactation. Allocation was adjusted after coccidiosis oocysts excretion measurement 14 days after weaning. This adjustment enabled to have excreting animals in each group at the beginning of the trial.

Animals were followed from weaning (28 days of age) to slaughtering. All evaluated products were incorporated in the concentrate feed that was offered *ad libitum*, only completed by straw. Growth performances were evaluated by individual weighing every three weeks. Oocysts of coccidia were sampled in faeces and counted using Mac Master Cell at 28, 55, 76 and 97 days of age.

2. Statistical analyses

Data were screened to detect abnormal values according to t-Student table. Normal data were then analysed using analysis of variance procedure (SPSS 20.0). When a significant effect of treatment was detected ($P<0.05$), differences among treatments were tested using the Duncan's multiple comparison test.

III – Results and discussion

1. Weight and average daily gain

Oilis improved significantly the weight of sheep lambs at sale in comparison with the 3 others groups ($P<0.05$). Particularly, the weight at sale for Oilis group was improved by 6.0% in comparison with negative control (+2.4 kg) (Table 1).

Oilis improved growth on global period ($P<0.05$), compared to decoquinate (+4.9%), negative control (+8.3%) and competitor (+10.1%).

This improvement of growth with Oilis is very similar to previous results obtained with decoquinate on goat kids and female lambs (Morand-Fehr, 1999 and 2000).

Table 1. Effect of treatment on weight and average daily gain (mean ± S.E.)

Feed	Negative Control	Decoquinate	OILIS	Vegetal extract competitor
GWeight at weaning±14d (kg)	15.1 ± 1.7	15.1 ± 2.0	15.6 ± 1.7	15.6 ± 1.8
Weight at sale (kg)	40.3 ± 3.7^{a}	40.7 ± 3.8^{a}	42.7 ± 2.5^{b}	40.3 ± 3.1^{a}
Average daily gain total period (g/d)	266 ± 40^{ab}	274 ± 52^{a}	288 ± 35^{b}	261 ± 45^{ab}

^{ab} Within a row, means with unlike superscript differ ($P<0.05$).

2. Oocyst excretion

Oilis enabled to reduce oocyst excretion at the age of 56 days (weaning +28 days): -62.6% at the peak, compared to negative control (Fig. 1). This reduction was more important than those also observed with decoquinate (-27.2%) and competitor(-43.9%).

Fig. 1. Effect of treatment on oocysts excretion according to the age.

Fig. 2. Effect of treatment on oocysts excretion at 28 days post-weaning.

During the oocysts excretion peak at 28 days post-weaning, proportion of sheep lambs with very low level of oocysts excretion (lower to 10 000 opg/g of faeces) was 37.0% for Oilis group, higher than negative control (23.3%) and very close to decoquinate (46.2%) (Fig. 2).

At the opposite, percentage of animals with oocysts excretion higher than 100 000 opg/g of faeces (level generally associated with symptoms), was very low in Oilis group (11.1%) compared to competitor (17.2%), decoquinate (26.9%) and negative control (40.0%).

IV – Conclusion

Effects of decoquinate on oocyst excretion was clear with reduction at excretion peak. Oilis effect was even stronger. The improvements observed with Oilis and decoquinate could be explained in part by a decrease of intestinal lesions. This would reduce the coccidial proliferation and facilitate the absorption of nutrients. The better growth is a result of this healthier situation.

Oilis enabled better growth than negative control but also than decoquinate. This illustrates the real potency of some natural products as alternative to chemoprevention.

Those results obtained with lambs confirmed previous ones obtained with goat kids, leading to very similar conclusions (Le Scouarnec *et al.*, 2012).

References

Chartier C. and Paraud C., 2012. Coccidiosis due to Eimeria in sheep and goats, a review. In: *Small Ruminant Research,* 103, pp. 84-92.

Le Scouarnec J., Benzoni G., Coutineau H., Marzin D. and Guyonvarch A., 2012. Effect of vegetal extracts on Cryptosporidiosis and Coccidiosis in goat kids fed with milk powder until weaning. In: *Book of abstracts XI International Conference on goats*, p. 32.

Morand-Fehr P., Guitard J.P. and Richard A., 2000. Utilisation du décoquinate chez les agnelles Lacaune : effet sur la croissance et la production laitière. In: *7e Rencontres Recherhes Ruminants*, p. 108.

Morand-Fehr P., Richard A., Teissier J. and Hervieu J., 1999. Utilisation du décoquinate chez les chevrettes d'élevage : effet sur la croissance et la production laitière. In: *6e Rencontres Recherhes Ruminants*, p. 208.