

Reproductive responses in ewes treated with eCG or increasing doses of royal jelly

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Abstract

This experiment was conducted to evaluate the effect of administering increasing doses of royal jelly (RJ) on reproductive parameters in ewes. Additionally, this study compared using RJ vs. equine chorionic gonadotropin (eCG) in estrous cycle control. In May (transitional period between anestrus and the breeding season) 37 multiparous, winter-lambing Awassi ewes 3–6 years of age (average body weight of 53 ± 1.2 kg) were fitted with intravaginal flourogestone acetate-impregnated sponges (FGA, 40 mg) for 12 days. Ewes were randomly assigned into five treatment groups to receive no RJ (CON, $n = 7$), 250 mg RJ/d (RJ250, $n = 8$), 500 mg RJ/d (RJ500, $n = 8$), 750 mg RJ/d (RJ750, $n = 7$), or 600 IU eCG (eCG, $n = 7$). Royal jelly was administrated orally on daily basis when sponges were in place while eCG was administered on the day of sponge withdrawal (d 0). Behavioral estrus was checked using fertile Awassi rams at 6 h intervals for 5 days beginning on d 1. Interval from d 0 to onset of estrus was shorter ($P < 0.05$) in eCG than in CON and RJ250 groups. No differences in the onset of estrus were detected among the RJ-treated groups. The intervals from d 0 to first progesterone rise were shorter ($P < 0.05$) in the eCG-treated compared with RJ-treated and control ewes (100 ± 15.3 , 138.4 ± 14 , 135.7 ± 15 , 155.6 ± 15 , 154.4 ± 15.1 h in eCG, CON, RJ250, RJ500, and RJ750, groups, respectively). The overall pregnancy rate from mating at induced estrus was 75.7% (28/37). Of these ewes, 23/37 (64.8%) lambled within 155 days following d 0. Lambing rate was higher ($P < 0.05$) in the RJ500 group compared with controls. Lambing rate from mating at induced estrus was 2/7 (28.5%), 4/8 (50%), 8/8 (100%), 4/7 (57%), and 5/7 (71%) in CON, RJ250, RJ500, RJ750, and eCG groups, respectively. Results of the present study demonstrate that eCG but not RJ was effective in improving estrus expression in ewes during the transition between the non-breeding and breeding seasons. Royal

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jelly may be effective in improving pregnancy and lambing rates but further studies are required to confirm such findings.

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1. Introduction

The seasonality of reproduction in sheep and goats is the major limitation in improving productivity. Controlling the seasonality in sheep is one of the most significant features of intensive production systems (Kusina et al., 2000) along with being a valuable aid to sheep management (Wheaton et al., 1993). Various treatments have been proposed to control seasonality (Delgadillo et al., 2002). Improving reproductive efficiency through estrus induction and synchronization can be accomplished through hormonal treatments including gonadotropins, progestagens, and luteolytic agents as prostaglandin $F_{2\alpha}$ ($PGF_{2\alpha}$) (Oliveira et al., 2001).

Estrus synchronization is a widely applied management technique in the sheep industry. It can be achieved through either reducing the length of the luteal phase of the estrous cycle with $PGF_{2\alpha}$ or its analogues (Husein and Kridli, 2003), or lengthening it by utilizing exogenous progesterone (Kusina et al., 2000). Equine chorionic gonadotropin (eCG) use in sheep estrus induction and synchronization programs is well established. It is applied following progestagen removal to improve follicular development, multiple births and conception rates.

Royal jelly (RJ) is a homogeneous substance secreted by the hypopharyngeal glands of worker bees to feed young larvae and the adult queen bee (Krell, 1996). Several studies reported positive effects of RJ on animal reproduction (Husein et al., 1999; Khattab et al., 1989). To our knowledge, the exact mode of action of RJ on reproduction is yet to be identified. It may exert its effects through containing hormone-like substances or through altering hormonal secretions in individuals who receive it.

Treating Awassi ewes with RJ in conjunction with exogenous progesterone has been used to induce estrus and improve the first service conception rate (Husein and Kridli, 2002a; Kridli et al., 2003). Administration of RJ either intramuscularly or orally has proven equally effective in improving estrus responses and pregnancy rate (Husein and Kridli, 2002a). The current study was designed to evaluate the effect of administering increasing doses of royal jelly (RJ) on estrous cycle control, pregnancy rate, and lambing responses in Awassi ewes. Additionally, this study compared the use of RJ with eCG in estrous cycle control.

2. Materials and methods

2.1. Location and animals

This study was conducted during the months of May and June at the Center of Agricultural Research and Production at Jordan University of Science and Technology located

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