



Response of sexually inactive French Alpine bucks to the stimulus of goats in oestrus

E. Carrillo^a, L.M. Tejada^b, C.A. Meza-Herrera^c, G. Arellano-Rodríguez^b, J.E. García^d,
M.A. De Santiago-Miramontes^b, M. Mellado^d, F.G. Véliz^{b,*}

^a Instituto Tecnológico de Torreón, Carretera Torreón, San Pedro Km 7.5, Torreón Coahuila, México

^b Universidad Autónoma Agraria Antonio Narro, Periférico Raúl López Sánchez y Carretera a Santa Fe, C.P. 27054, Torreón, Coahuila, México

^c Universidad Autónoma Chapingo, Unidad Regional Universitaria de Zonas Áridas, Bermejillo, Durango, México

^d Universidad Autónoma Agraria Antonio Narro, Departamento de Nutrición Animal, C.P. 25315, Saltillo, Coahuila, México

ARTICLE INFO

Article history:

Received 17 February 2011

Received in revised form 2 June 2011

Accepted 4 June 2011

Keywords:

Oestrus

Ovarian activity

Male effect

Pregnancy rate

ABSTRACT

This study was designed to investigate whether sexually inactive French Alpine bucks stimulated with goats in oestrus are able to induce oestrus and ovulation in anoestrus goats under intensive conditions at latitude 26° N. Fifty-nine adult anoestrus French Alpine goats were randomly assigned to one of four treatment groups: exposure to stimulated (n = 14) or non-stimulated (n = 15) bucks in March and stimulated (n = 15) or non-stimulated (n = 15) bucks in June. Additionally, the sexual behaviour exhibited by bucks in contact with penned goats was recorded during two consecutive observation sessions lasting 1 h each. The oestrus response was 79 and 100% for goats exposed to stimulated bucks in March and June, respectively, but none of the goats exposed to the non-stimulated bucks entered oestrus in either breeding seasons. Pregnancy rates based on ultrasonographic examination at 50 d post-copulation were lower ($P < 0.01$) in goats exposed to stimulated bucks in March (50%) compared to goats bred in June (80%). For both breeding seasons, none of the goats exposed to non-stimulated bucks kidded. The interval to oestrus was shorter (68 ± 2 vs. 141 ± 13 h) and more synchronised in goats exposed to stimulated bucks in June than goats exposed to bucks in March. The frequencies of flehmen, nosing, and approaches were higher ($P < 0.01$) in simulated bucks than non-stimulated bucks. It was concluded that the exposure of sexually inactive bucks to goats in oestrus is an inexpensive, practical and efficient way to elicit sexual activity in bucks, which subsequently triggers breeding activity of anoestrus French Alpine goats.

© 2011 Elsevier B.V. All rights reserved.

1. Introduction

The seasonal nature of reproduction in dairy goats in northern Mexico (26° N) is a serious problem for the goat industry because it impedes accelerated kidding, limits access to favorable seasonal markets and produces seasonal cycles of goat meat and milk yield. The proven efficiency of hormones to induce oestrus in seasonally anoestrous goats has been amply demonstrated (Chemineau et al., 1999; Leboeuf et al., 2000), but

the use of this technology is too expensive in extensive or semi-extensive goat production systems.

Sexual activity can be induced in spring by exposure of bucks to artificially long days (16 h of light/day) for 2.5 months beginning in December (Delgadillo and Vélez, 2010). This procedure, however, is not feasible for goat producers in northern Mexico under range conditions due to the high cost of this technology and the absence of electricity in the goat pens.

At latitude 26° N, ovulation in goats during the non-breeding season can be induced by exposure of goats to sexually active bucks. However, the buck effect in spring is unreliable (de Santiago-Miramontes et al., 2011; Mellado et al., 2011) because dairy goats at this latitude exhibit a “shallow” anoestrus, and

* Corresponding author. Tel.: +52 871 729 76 10; fax: +52 871 7331210.
E-mail address: velizderas@yahoo.com (F.G. Véliz).

they are able to display full oestrus activity in spring only if sexually active bucks are exposed to does (Véliz et al., 2006a, 2009).

Thus, a simple and practical technique to induce sexual activity in bucks in spring is needed. One possibility is to expose sexually inactive bucks to goats in oestrus, as female goats in oestrus female goats in seasonally anovulatory counterparts (Restall et al., 1995; Walkden-Brown et al., 1993, 1994). This response has been described in Cashmere goats; hence, it is of interest to determine whether goats in oestrus are able to induce sexual activity in dairy bucks during the non-breeding season in northern Mexico. Thus, the objective of the present study was to determine 1) whether exposure of bucks to goats in oestrus can promote the bucks' sexual activity, 2) whether bucks respond to goats in oestrus goats as well in March as in June, and 3) to compare the responses of anoestrus goats to sexually active bucks during these months.

2. Material and methods

2.1. Goat management

The study was conducted in a commercial dairy herd operation in northern Mexico (26° 23' N, 104° 47' W) in March and June of 2009. Fifty-nine multiparous (3–4-year-old, 2.2 ± 0.3 body condition score, scale 1 to 4; Walkden-Brown et al., 1993) French Alpine goats were used in this study. Goats were confined and had free access to water, a trace mineral mix and alfalfa hay (17% CP, $1.95 \text{ Mcal kg}^{-1}$). During milking (06:00 and 17:00 h), each goat was offered 150 g of concentrate (14% CP, 2.5 Mcal kg^{-1}) in the milking parlour.

2.2. Treatment to induce oestrus in anoestrus goats and sexual activity in bucks

Goats were randomly allocated to one of four groups: exposure to stimulated ($n=14$) or non-stimulated ($n=15$) bucks in March and stimulated ($n=15$) or non-stimulated ($n=15$) bucks in June. The percentage of goats in oestrus, the percentage of pregnant goats and the oestrus intervals after introduction of bucks were recorded. Bucks remained permanently with does for 21 d. All anoestrus goats received a single I. M. injection of 25 mg progesterone (Progestelas E, Qro., Mexico) in 1 ml vegetable oil prior to buck exposure to reduce the occurrence of short luteal cycles (Pellicer-Rubio et al., 2006). Each group of seasonally anoestrus goats was placed in pens of $5 \times 10 \text{ m}$ that were 300 m apart (Walkden-Brown et al., 1993).

Sixteen French Alpine adult sexually experienced bucks were used for this study. Bucks were randomly distributed into 4 equal groups. One group was exposed to 2 oestrus-induced goats for 60 min daily for three weeks before exposing them to a group of anoestrus goats in March. Another group of 4 adult bucks with proven fertility were not exposed to oestrus-induced goats during this month and served as controls. This procedure was repeated with eight different bucks (4 stimulated and 4 non-stimulated bucks of the same breed) in June.

Both in March and June, two anoestrus adult goats were subcutaneously injected every two days, with 2 mg estradiol cypionate (Estradiol, Qro., Mexico) in 1 ml vegetable oil. This

treatment regime allowed goats to be brought into a permanent oestrus during the three weeks of exposure to bucks (1 h daily).

2.3. Detection of oestrus activity and pregnancy

Throughout the study, goats in oestrus were detected twice daily by direct visual observation by two trained persons (08:00 and 17:00 h). Goats were considered to be in oestrus when copulation occurred. Pregnancy was diagnosed by transrectal ultrasonography using a 5.0 MHz transducer (Supply, Inc., Tequesta, Florida, USA) 50 d after mating (Evans et al., 2000).

2.4. Evaluation of male reproductive behaviour

The male reproductive behaviour was evaluated during the first two days of exposure to anoestrus goats for one h (08:00 to 09:00 h) before the morning meal. The sexual behaviour was recorded by two trained technicians. The behavioural components recorded were flehmen (lip curled and head erected), nosing (nasal investigation of anal–genital region), approaches, mount intention (attempts to mount or mounts without pelvic oscillations) and complete mount (mounts accompanied by pelvic oscillations and ejaculation) (Véliz et al., 2006a).

2.5. Statistical analyses

The percentages of goats in oestrus and the conception rates were analysed as binomial data with the LOGIT function of the PROC GENMOD procedure of SAS (SAS Inst. Inc., Cary, NC, USA). The model statement contained the effects of treatment (stimulated or non-stimulated bucks), month of breeding and the interaction between these variables. The interval to oestrus was analysed by the GLM procedure of SAS. For behavioural traits, data based on cumulative totals were analysed by the GLM procedure of SAS using a model that included the treatment applied to the bucks, the month of breeding and the interaction between the treatment and the month of breeding.

3. Results

3.1. Goat response to buck stimulus

The presence of an oestrus response within three weeks of buck exposure, the pregnancy rate and the interval to the onset of oestrus are presented in Table 1. The percentage of goats exhibiting oestrus in March and June and the resulting pregnancy rates differed significantly (treatment $\times$ breeding period; $P < 0.05$), therefore comparisons between stimulated and non-stimulated bucks were made within each breeding period. Overall, 90% of the eligible goats responded to the stimulus of bucks that had been previously exposed to goats in oestrus, whereas none of the goats exposed to control bucks exhibited oestrus (Table 1). The pregnancy rate of goats induced into oestrus by stimulated bucks was significantly higher in June (80%) when compared to goats bred in March (50%), and there were no parturitions from goats exposed to untreated bucks. The interval to oestrus was shorter (Table 1)

Download English Version:

<https://daneshyari.com/en/article/5790642>

Download Persian Version:

<https://daneshyari.com/article/5790642>

[Daneshyari.com](https://daneshyari.com)