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Animal Reproduction Science 111 (2009) 214–219

ANIMAL REPRODUCTION SCIENCE

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Cria alpaca body weight and perinatal survival in relation to age of the dam

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Received 30 March 2007; received in revised form 20 February 2008; accepted 10 March 2008
Available online 15 March 2008

Abstract

The present study with alpacas determined effect of dam's age on body weight and survival of cria during the first week of life. Pregnant dams ($n = 424$) and their crias were used in the study. Cria body weight (kg) was determined at time of placenta expulsion. Placenta weight and larger width were measured immediately after expulsion. Crias were monitored for the first week and a necropsy was performed if death occurred. Data were analyzed using analysis of variance. The body weight of crias at birth, the weight, and the largest width of placenta increased with age of the dam ($P < 0.05$), reaching a peak at 9 years and then declined progressively. Placental efficiency also increased with the dam's age, and showed a bimodal shape, peaking at 6- and 11-year-old dams ($P < 0.05$). Altogether, 398 crias survived and 26 died; of those 6 died of starvation, 5 of hypothermia, 4 were stillborn and the rest from other miscellaneous causes. More crias died from 2-year-old dams than from dams of any other age ($P < 0.05$). In addition, dead crias had lesser body weights (6.4 kg) than those of crias that survived (7.8 kg, $P < 0.05$). The weight and width of the placenta was similar for live and dead crias.

Keywords: Alpaca-placenta; Cria weight; Perinatal period; Survival

1. Introduction

Under South American conditions, age composition of alpacas at time of parturition varies from 2 to more than 12 years. Parturitions over a 2-month period due to seasonal reproductive management, and coincides with the summer months in the southern hemisphere. During these

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doi:10.1016/j.anireprosci.2008.03.001

months (January through March) green and succulent pastures that contribute to milk production for the survival of the neonate prevail. In other livestock species and under similar conditions of management with the alpaca, lambs and calves are also born during months with abundant pastures. The age of ewes has a significant role in birth weight of lambs, as well as in its likelihood of survival (Alexander, 1964). In addition, placental size varies according to age of the dam (Alexander, 1964; Foote et al., 1959), and fewer smaller lambs tend to survive than lambs with normal weight (Moule et al., 1956; Alexander, 1964). This also occurs in alpacas (Garmendia et al., 1987).

The aims of the present study were to determine the body weight of crias in relation to age of their dams, and determine any relationship between perinatal cria mortality and age of dam. Moreover, placental efficiency, weight, and largest width were correlated with cria survival and/or death during the same period.

2. Materials and methods

For the present study, 424 pregnant females were separated randomly from a total of 1200 pregnant females. The ages of females at time of parturition were determined by using ear tags that were placed at time of their birth. Females were continued to graze native pastures at the La Raya Research Center, which is located at 4200 m sea level, and at 71° west longitude, 14° south latitude.

Birth weight of crias (kg) was determined when females expelled the placenta. Placenta weight (g) was recorded after its liquid was discarded. The greatest placental width (cm) was measured at the section where the left uterine horn joins with the uterine body. Crias were monitored for the first week, and if any died, a necropsy was performed to determine cause of death. All of these were done following the management protocol during parturition at the Research Center. Placental efficiency was determined by dividing body weight of cria by placenta weight at birth (Dwyer et al., 2005).

Data were analyzed using GLM procedure analysis of variance (Number Crunching Statistical System, Kaysville, UT, USA) with an uneven number of repetitions. Duncan's test was performed to determine significant differences. In cases of dead crias, percentages were determined to compare to live crias in the same age group of dams, and Chi-square test was performed to determine differences.

3. Results

3.1. Dam age effect on cria body weight

The overall mean cria weight at birth was 7.7 kg. The means of cria body weight by the age of their dams are depicted in Fig. 1. In general, cria body weight increased with age of dam, peaking with 9-year-old dams, and then began to decline.

3.2. Placenta weight in relation to age of the dam

The general mean for placenta weight was 879. 4 g (Fig. 2), it was 847.9 g with 2-year-old dams, increasing steadily in older dams and peaking in dams between 8 and 9 years of age (977.6 g), and then declining to 835.8 g in 12-year-old dams ($P < 0.05$).