

MANIFESTATION OF HEAT IN A FIVE-MONTH- OLD JERSEY MESTIZA CALF – CASE REPORT

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Abstract: The process of puberty is closely related to the release of gametes and the demonstration of sexual behavior, that is, receptivity to mounting, and is also closely related to the animal's first heat. For a heifer to begin reproductive activity early, several influencing factors must be taken into consideration, such as nutritional management, weight gain and the animal's genetics. In general, pure Jersey females enter puberty at an average of eight to twelve months of age, a situation contradicted by the animal in the present report, which began to show heat at five months. The animal was monitored, observing that every 21 days there was a repetition of estrous behavior. We sought to study the relationship between such behaviors and the onset of puberty in the calf, seeking to associate the main factors responsible, using the methods available in that context. It was concluded that the probable cause was nutritional availability, also associated with the genetics and breed of the animal, which allowed the physiological capacity to express heat, even though zootechnical puberty had not been reached. However, it is pertinent to carry out more studies in similar situations.

Keywords: Heifer, Jersey, manifestation of heat, precocity.

INTRODUCTION

The definition of puberty is related to the ability to release gametes and demonstrate sexual behavior, such as receptivity to mounting, being closely linked to the female's first heat. Its onset is more linked to physiological age (body size or weight) than to chronological age (CARVALHO et.al., 2003; HAFEZ & HAFEZ, 2004; SENGER, 2005). Puberty must not be understood as a single event, but as a process, since the first ovulation may not be accompanied by signs of estrus, characterizing silent heat (SENGER, 2005).

In general, the sexual precocity of most of the Brazilian herd leaves something to be desired, since heifers tend to be late (SILVA et.al., 2018). This summary aims to discuss a case of heat manifestation in a five-month-old Jersey crossbreed calf, demonstrating that it is an extremely precocious animal, contrary to the national average, and also exceeding the average age at puberty for the pure breed.

CASE REPORT AND DISCUSSION

A five-month-old Jersey heifer, belonging to a property located in Ribeirão da Mata, Santa Luzia – MG, daughter of a crossbred Jersey cow and a pure Jersey bull, through artificial insemination (AI), showed heat. The animal showed typical estrus behavior, with incessant mooing, agitation, attempts to mount and accepting to be mounted by other females.

At first, it was thought that there was a hormonal dysregulation, and that the effective manifestation of heat would only be repeated at the physiological age for the pure breed, around eight to twelve months (GETZEWICH, 2005; HAFEZ & HAFEZ, 2004; REECE, 2017). However, after exactly 21 days, the average duration of a normal bovine reproductive cycle (HAFEZ & HAFEZ, 2004), the estrous manifestation reoccurred, with the same signs, intensified, and with the addition of muco-bloody secretion eliminated by the vagina after approximately two days later, hemorrhage typical of metestrus. After another twenty days, there was a new manifestation of estrus. The signals were intensified again, and the acceptance of mounting was recorded (Fig. 1-A), and excretion of mucus through the vulva (Fig. 1-B).

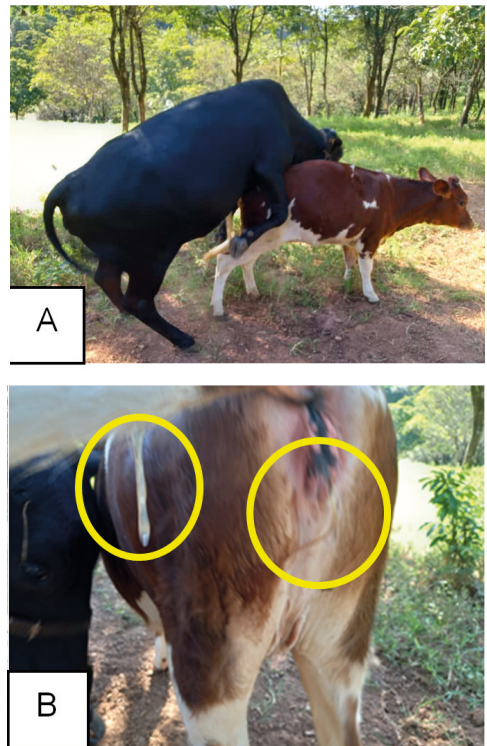


Figure 1: A) Acceptance of the mounting attempt by another female in the herd; B) Presence of translucent mucus eliminated from the calf's vulva, highlighted within the circumferences.

(Source: Personal collection - Thaís Ribeiro)

To estimate the weight of the animal, then approximately six and a half months old and in its third manifestation of estrus, due to the unavailability of scales, the Quetlet equation was used, expressed by $P = L^2 \times L \times 87.5$, where P represents the live weight in kilograms, equivalent to the product of the square of the chest circumference (C) in meters, the length of the body from the region of the acromion of the scapula to the gluteal region (L) in meters and the coefficient 87.5. The estimated result for the calf was 234 kg. Subsequently, a measuring tape was used to weigh cattle, in order to confirm the value, obtaining a difference of just 1 kg.

On every occasion of estrus, the animal was separated in order to avoid accidents caused by the mounting of other animals in

the herd, older and heavier females. It was not possible to perform an analysis of internal reproductive structures or check whether there was a hemorrhagic body or corpus luteum in the subsequent days due to the unavailability of ultrasound and the small size of the animal, due to its age, also making transrectal palpation unfeasible.

The age at which puberty is reached is related to genetic, nutritional and environmental factors (GUERREIRO, 2009). Animal selection, combined with genetic improvement through the use of biotechnology, such as AI, has proven to be a good tool for obtaining earlier females, since the age at first ovulation is a highly heritable characteristic. There are also improvements in the supply and nutritional quality of the food provided to the animals, so that dairy heifers are able to enter puberty early, when they reach 40% of their adult weight (CARDOSO & NOGUEIRA, 2007; HAFEZ & HAFEZ, 2004).

This age directly influences the economic viability of production, since an early heifer is younger at first calving, and consequently greater production of milk and calves throughout its useful productive life. This situation is not the reality of the average Brazilian herd, in which heifers are late due to multiple factors, especially nutritional management (SILVA et.al., 2018).

The calf in question was subject to good quality nutritional management, with free pasture and water, and access to breastfeeding after the mother's milking was in good quantity. Thus, it is suspected that she reached the minimum body weight to enter puberty at a very young age, which, for pure Jersey heifers, varies between 192 and 230 kg (ALMEIDA et.al., 2013; CARVALHO et.al., 2003; GETZEWICH, 2005). With increasing weight, the acquisition of adipose tissue by animals leads to the production of

leptin, a hormone responsible for activating hypothalamic mechanisms that culminate in the secretion of GnRH (gonadotropin-releasing hormone) and gonadotropins, and consequent stimulation of the beginning of the estrous cycle (ALMEIDA et.al., 2013; SANTOS & SÁ FILHO, 2006).

It is important to highlight that this ideal weight must be achieved in conjunction with monitoring weight gain, in order to avoid accumulation of fat in the mammary gland, which would affect milk production in future lactation (CARVALHO et.al., 2003).

The studied calf had an estimated weight of 234 kg when measured during her third heat. Considering a maximum average daily weight gain of 0.9 kg/day (CARVALHO et.al., 2003), it is estimated that its first manifested estrus occurred at approximately 196 kg, a value within the expected range for the breed, but at an age extremely early.

The multiplication of superior genetic material, through artificial insemination, a process that consists of the deposition of sperm in the female's reproductive tract in an artificial way (BARBOSA & MACHADO, 2008), and which makes it possible to increase genetic gain and reproductive efficiency in herds (BARUSELLI et.al., 2019) was another contributing factor to the precocity of the calf in question, since it is the result of AI.

However, even if, given the signs presented, the calf has effectively entered physiological puberty, zootechnical puberty, that is, sexual maturity, which corresponds to the age at which the animal reaches its maximum reproductive potential, presenting the ability to become pregnant and carry a pregnancy term, had not yet been fully achieved. Normally, two or three estrous cycles with normal phases occur, between 40 and 60 days after puberty, for this maturity to be reached (SANTOS & SÁ FILHO, 2006).

FINAL CONSIDERATIONS

It was concluded that the probable first cause of the calf's manifestation of estrus was nutritional availability, also associated with the animal's genetics and breed, which led to the physiological capacity to manifest heat,

even if zootechnical puberty had not been reached.

Further studies are needed using similar cases, especially involving the analysis of the reproductive tract and internal structures present through ultrasound and transrectal palpation.

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