

Animal welfare, etológia és tartástechnológia



Animal welfare, ethology and housing systems

Volume 8

Issue 2

Gödöllő
2012



SOME VALUATION MEASUREMENT CHARACTERISTICS OF BLONDE D'AQUITAINE CALVES IN A BREEDING HERD

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Summary

The authors examined pedigree Blonde d'Aquitaine offspring kept on a grazing husbandry system under large scale conditions. The measurements were carried out at the Dörögdi Mező Ltd. Animal Breeding Site in Taliándörögd, Hungary.

The study included 26 calves. The birth weights of these were then recorded, furthermore prior to turning out to pasture they were individually weighed, likewise again after 84 days at the end of the examination period and finally at weaning.

In the case of 26 calves the most important body measurements (height at withers, height at rump, heart girth, length of body, cannon girth) were taken immediately after birth and also at 3 months of age and using these values the most important body ratio indexes were calculated.

The weight of the calves at birth was 42.5 kg, when turning them out to pasture this was 69 kg, at 3 months this was 145.5 kg, and at weaning the average live weight was 188 kg.

In the case of characteristics measured with a measuring stick or a measuring tape the bull calves had higher birth data than the heifer calves, but we could only show a significant difference in the case of the leg measurement. In the case of height data measured at 3 months (height at withers, height at rump) we did not experience any difference among the sexes. In the case of our data measured with a measuring tape (heart girth, length of body, cannon girth) however we experienced that the heifer calves showed higher growth in all three characteristics than the bull calves.

Keywords: calf, body weight, body size.

Introduction

The Blonde d'Aquitaine is French beef cattle, characterised by well developed muscles, which is extremely desirable from an economic point of view (*Morand, 1985*). The breed is characterised by easy calving, fast growing, special meat quality and outstanding output at slaughter (*Wagenhoffer, 2006*).

duct of the beef cattle cows are the weaned calves. In France there is a longstanding tradition of weighing Blonde d'Aquitaine calves at weaning. By contrast in Hungary this process is not yet a part of daily practice in all cases (*Balika, 2007*).

The French *Midatest* breed description considers the 47kg birth weight of bull calves and 44kg birth weight of heifer calves standard values. Based on Hungarian tests the optimum birth weight for bull calves is 49kg and for heifer calves is 46kg (*Balika, 1991b*). The optimum weight



achieved at 120 days under intensive conditions by bull calves is 176 kg on average and by heifer calves is 168 kg (Wagenhoffer, 2006). According to the French breed description the optimum weight at weaning for bulls is 233 kg, whilst in the case of heifers this value is 212 kg (Balika, 1991b).

In addition to the recordings above the body measurement data of the calves are also very important. The objective of recording body measurements is to be able to compare the individual animal with the breeding standard, to gain information about the development of that individual, to be able to check the results of the breeders' aims and to give us numerical data concerning individuals which live separately from one another in both time and space (Mihók, 2004).

The most important measuring points, the body measurements and the methods of recording these were studied on various farm animals (horse, cattle) (Schandl, 1955; Horn, 1973; Bodó and Hecker, 1992; Cabral et al., 2004; Batista Pinto et al., 2008; Zechner et al., 2001). According to Balika (1991a) a Blonde d'Aquitaine cow having a live weight of 750 kg has an average height at withers of 140 cm, length of body 175 cm, and heart girth around 210 cm.

Since there is little information available on this genotype, the objective of our examination was to announce more up to date information on the weight examination and body measurements of calves from birth to weaning.

Materials and Methods

We carried out our examinations between April and October 2010 at the Animal Breeding Site of the Dörögdi Mező Ltd. at Taliándörögd. The calving period lasted from 28th April 2010 until 5th June 2010.

There were 26 calves born to the 25 cows under examination (1 cow had twin calves), and their weight at birth were recorded. After birth the calves were housed for 2-40 days in stable. Following this the calves were put out to pasture together with the cows, where they spent 84 days. In the case of the examined individuals weighing took place prior to going out to pasture, after 84 days at the end of the examination, and at weaning, with an accuracy of ± 0.5 kg. Our second measurement was defined as the weight measurement at 3 months. Based on our obtained results we then also calculated the corrected live weight of the calves for 120 and 205 days (Szabó, 2004).

$120 \text{ days weight} = (\text{weight at weaning} - \text{birth weight} / \text{age at weaning}) * 120 + \text{birth weight}$

$205 \text{ days weight} = (\text{weight at weaning} - \text{birth weight} / \text{age at weaning}) * 205 + \text{birth weight}$

The weight data was compared in all four cases using a t-test according to sex. For the purposes of body size recording, 26 of the born calves were measured. Body size was recorded according to Bene et al., 2005. We recorded the most important body measurements immediately after birth and at 3 months (height at withers, height at rump, heart girth, length of body and cannon girth) accurate to ± 0.5 cm.

A measuring stick was used for assessing the height at withers and the height at rump whilst a measuring tape was used to measure the heart girth, length of body and cannon girth. Based on our data we calculated the change in body size between two measurements and the % ratio of the change.

We carried out the evaluation of our results with an error probability level of $P=5\%$. For the evaluation of the data we applied the t-test and a single factor variant analysis (SPSS 9.0.).



Results

The bull calves had bigger birth weights (44.6kg) than the heifers (39.9kg). This deviation of 5kg can be explained by sexual dimorphism (*Table 1.*) The average of the birth weights we measured was in both sexes slightly below the breed description values of the French *Midatest* (where 47kg and 44kg respectively were measured (*Balika, 1991b*)). The average was 42.4kg; the bull calves showed 11% heavier birth weights than the heifers. These are similar to the results of *Kertz et al., (1997)*.

The average weight when putting out to pasture was 69.5kg. We weighed the calves again after 84 days on pasture at which point the bull calves were 8kg heavier than the heifer calves. At 3 months the bull calves weighed close to 150kg. In this case our results were better than the values given in the French *Midatest breed description (1972)* (*Balika, 1991a*). In the case of the other pasture phase the bull calves retained their heavier weight advantage of a few kg and closed with an average weaning weight of 192kg.

Table 1.: Sex effect on the weight of calves at the time of birth, getting on pasture, weaning adjusted 120- and 205-day weight

| Sex | Birth weight | Getting on pasture weight | 3-month weight | Weaning weight | Adjusted 120-day weight | Adjusted 205-day weight |
|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| | average± standard deviation | average± standard deviation | average± standard deviation | average± standard deviation | average± standard deviation | average± standard deviation |
| Heifer calf n=12 | 39,9±9,5 | 68,5±23,0 | 141,0±34,0 | 184,0±32,5 | 149,0±27,0 | 226,0±27,0 |
| Bull calf n=14 | 44,6±6,7 | 70,0±19,0 | 149,0±28,0 | 192,0±27,0 | 159,0±28,0 | 241,0±28,0 |
| Total n=26 | 42,4±8,3 | 69,5±20,5 | 145,5±30,5 | 188,0±29,5 | 154,0±27,5 | 234,0±27,5 |
| Significance | NS | NS | NS | NS | NS | P<0,05 |

Comment: treatments without the same superscript differ significantly (P<0,05).

The weight at weaning of the heifer calves was 184 kg on average, which was 8 kg less than of bull calves. We did not find the weight differences significant between the sexes at birth, when turning out to pasture, at 3 months and at weaning.

Body measurement data of the calves are summarised in (*Table 2.*) according to sex, at birth and at 3 months. The height at withers (74.0cm) in the case of bull calves was on average 2cm more than in the case of the heifer calves.

At 3 months we noticed a difference of exactly 3cm in favour of the bull calves. At this body size both sexes showed a 30% increase over 3 months.

When measuring rump height at birth we measured 2.5cm more for the bulls than for the heifers (♂ 77.0cm; ♀ 74.5cm).



This difference had doubled by the 3 month measuring, when the bull calves had an average rump height of above 1meter. The growth of the bull calves was 35% compared to birth, whilst the heifers showed a 33.5% growth rate. We did not experience a significant difference between the measured data.

Table 2.: Body measurement data of observed calves at birth and at the age of 3 months

| Body measurements | At birth (cm) | At 3 month age (cm) | Changing (cm) | Changing (%) |
|--------------------------|---------------|---------------------|---------------|--------------|
| Height at withers | | | | |
| -bull calf | 74,0±3,0 | 97,0±6,0 | 23,0±6,0 | 31,0±9,0 |
| -heifer calf | 72,0±3,5 | 94,0±6,0 | 22,0±5,5 | 31,0±8,0 |
| - total | 73,0±3,5 | 95,5±6,0 | 22,5±5,5 | 31,0±8,5 |
| - significance | NS | NS | NS | NS |
| Height at rump | | | | |
| -bull calf | 77,0±3,0 | 104,0±6,0 | 27,0±6,0 | 35,0±8,0 |
| -heifer calf | 74,5±4,0 | 99,5±6,0 | 25,0±5,5 | 33,5±8,0 |
| - total | 76,0±3,5 | 102,0±6,5 | 26,0±5,5 | 34,5±8,0 |
| - significance | NS | NS | NS | NS |
| Heart girth | | | | |
| -bull calf | 79,0±4,0 | 119,0±8,0 | 40,0±7,0 | 51,5±6,0 |
| -heifer calf | 75,0±6,0 | 116,0±13,0 | 41,5±10,0 | 55,5±12,0 |
| - total | 77,0±5,0 | 118,0±10,5 | 41,0±8,0 | 53,0±10,20 |
| - significance | NS | NS | NS | NS |
| Length of body | | | | |
| -bull calf | 63,0±4,0 | 92,0±7,0 | 29,0±6,0 | 47,0±10,0 |
| -heifer calf | 61,0±7,0 | 93,0±6,0 | 32,0±5,0 | 53,0±13,0 |
| - total | 62,0±5,0 | 92,0±6,0 | 30,0±5,0 | 49,5±11,5 |
| - significance | NS | NS | NS | NS |
| Cannon girth | | | | |
| -bull calf | 12,0±1,0 | 14,5±1,0 | 2,5±0,5 | 19,5±6,0 |
| -heifer calf | 11,0±1,0 | 13,5±1,0 | 2,5±0,5 | 21,5±5,0 |
| - total | 12,0±1,0 | 14,0±1,0 | 2,5±0,5 | 20,5±6,0 |
| - significance | P<0,05 | P<0,05 | NS | NS |

Comment: treatments without the same superscript differ significantly (P<0,05).

In the case of heart girth we measured 4cm difference at birth in favour of the bull calves (♀ 75.0 cm; ♂ 79.0 cm). After 3 months this measurement reduced to 3cm, which meant that



during this period the growth of the heifers was slightly better than that of the bull calves. The heifer calves showed a 55.5% growth in heart girth from birth in contrast to 51.5% growth by the bull calves.

We measured 2cm more for the length of body at birth in the case of bull calves than for the heifers. We experienced no significant difference between the sexes at weaning when their length of body measured 93cm.

In the case of the heifer calves the change in the length of body was 3cm more than in the case of the bull calves. In terms of percentages this meant on average that over 3 months the heifers grew more than 53% longer compared to the 47.0% lengthening of the bull calves.

The evaluation of the cannon girth measurement showed that both at birth and at weaning the bull calves had a measurement of nearly 1cm more than the heifer calves. This was the only case where we found a significant difference between the sexes. During this measurement the growth of both the bull calves and of the heifers was the same over a 3 month period.

1. Picture.: The measurement of Blonde D'Aquitaine calves at 3-month age





2. picture: The measurement of heart girth with measuring tape



Discussion

The weight of the calves at birth was on average 42.4kg. After brief housing when put out to pasture we measured an average weight of nearly 70kg. When changing the grazing strip, i.e. approximately when the calves were 3 months old, the average weight was 145.5kg. The calves closed the examination at weaning weighing 188.0kg

During the course of all weighing the bull calves showed higher values than the heifers. We experienced a significant difference in the 3 months weight and the weaning weight, when the bull calves had an advantage of over 8kg.

In the case of characteristics measured with a measuring stick or a measuring tape the bull calves had a higher birth weight than the heifer calves, but we could only show a significant difference in the case of cannon girth measurement.

In the case of height data measured at 3 months (height at withers, height at rump) we did not experience any difference among the sexes. In the case of our data measured with a measuring tape (heart girth, length of body, cannon girth) however we experienced that the heifer calves showed higher growth in all three characteristics than the bull calves.



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