

RESEARCH REGARDING BABY CALVES HOUSING IN INDIVIDUAL IGLOOS NESTLED OUTSIDE BARN

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Abstract

Baby calves housing in individuals igloos nestled outside barn is a technology used in more and more cattle farms located in areas with less favourable climatic conditions.

To show the influence of environmental condition on corporal development of Romanian Black Spotted calves, housing in igloos placed outside barn (first month of life, due to the limited number of igloos) was organized an experience on a batch of 345 calves from Dancu farm Iasi.

The statistical data presented in synthetically tables show a monthly average temperature between -2.6°C in winter and 21.8°C in summer, 91.30 % relative humidity in winter and 59% in spring, 3.03 m/s wind speed in winter and 2.3 m/s in summer. Body weight at calving was almost equal in autumn (40.68 Kg), winter (40.73 Kg) and spring (40.53 Kg) and significant smaller in summer (38.82 Kg). These seasonal differences persist also at 30 days old too. The average daily gain depending of calving season was between 0.695 Kg/day in summer to 0.765 Kg/day in autumn-winter season and 0,762 Kg/day for total season. The average daily gain by calves' sex had significant differences, 0.711 Kg/day for females and 0.762 Kg/day for males. Also calves mortality was bigger in summer than the other seasons. The calves born in winter season had a good resistance and vitality.

Key words: housing, baby calves, individual igloos, corporal development, average daily gain

INTRODUCTION

Baby calf housing throughout the year in individual igloos nestled outside the barn is a technology used in more and more farms of members of the Bovidae family situated in less favorable climatic conditions [4, 7]. In this paper, we focused on the influence of the environmental conditions on the body development of the Romanian Black Spotted calves. The Moldavian region from Romania, especially Iasi County, has a climate with a strong continental character influenced by the air masses coming from the eastern areas; winters are harsh and summers are hot. The maximum temperature registered was 40°C (July 29th 1909), whereas the minimum temperature was - 36.3°C (February 1st 1937).

MATERIAL AND METHOD

The research was carried out for one year (March 2009 – March 2010) so as to go through all the seasons. We studied 345 Romanian Black Spotted calves obtained at S.C.D.C.B. Dancu Iași (Research-Development Station for Bovine Growing)

and distributed by sex (males, females) and season (spring, summer, autumn, winter). The parameters under study were: monthly average temperature (°C), air relative moisture (%), wind speed (m/s), weight at birth and at the age of 30 days, body development based on the main corporal sizes, the average daily gain depending on the calving season and sex and the calf mortality losses in the experimental period.

The primary data were systematized, processed and interpreted [1] by methods specific to such researches (\bar{X} , $\pm s$, \bar{X} , s , $V\%$, Fisher test). At the same time, the data analysis was made by combination and correlation with the numerous farm observations.

RESULTS AND DISCUSSIONS

The climatic parameters outside the barn in the experimental period are given in table 1. From the analysis of these data it results that, depending on the calving season, temperature had an average value ranging

between -2.6°C in winter and 21.8°C in summer, and the relative moisture was 91.3% in winter and 59% in spring. The air currents were more intense in winter 3.03 m/s and 2.3 m/s in summer [6, 7].

Table1 Average climatic parameters outside the barn according to the meteorological station of Iași

Season	Year	Month	Monthly average temperature $^{\circ}\text{C}$	Relative moisture (%)	Wind speed m/s
Spring	2009	March	4	72	3.2
	2009	April	12	49	2.7
	2009	May	16.9	56	2.6
Average for the spring period			10.96	59	2.83
Summer	2009	June	21	65	2.2
	2009	July	23.1	65	2.6
	2009	August	21.3	65	2.1
Average for the summer period			21.8	65	2.30
Autumn	2009	September	17.5	65	2.2
	2009	October	11.1	82	2.5
	2009	November	6.5	89	2.6
Average for the autumn period			11.7	78.66	2.40
Winter	2009	December	-1.3	91	2.8
	2010	January	-6	93	3.2
	2010	February	-0.7	90	3.1
Average for the winter period			-2.6	91.3	3.03

By analyzing the differences in terms of body weight at birth and at the end of the housing in individual igloos and the daily average gain depending on the calving season, we noticed the following characteristics (tab. 2): the body weight at birth was approximately equal in the seasons of spring (40.53 kg), autumn (40.68 kg) and winter (40.73 kg) and significantly lower in summer (38.82 kg). These differences are kept at the age of 30 days – 62.73 kg in spring, 63.09 kg in autumn, 63.43 kg in winter and 59.69 kg in summer. The daily average gain (g/day) depending on the calving season ranged between 0.69 g/day in summer and 0.75 g/day in winter, and for all seasons it was 0.758 g/day (tab. 3).

As for the food consumption, this was 6-7 kg of milk per calf and day, larger quantities being registered in winter due to the low temperatures that contributed to the intensification of the metabolic functions.

Among the diseases specific to the suckling calves [2], we noticed a significant reduction of enteritis and bronchopneumonia as well as a total reduction of the cases of

umbilical infections. Among the health problems encountered, we may mention the gastrointestinal problems, especially in the warm periods of year influencing the calf's appetite and favoring the infection sources.

The calf mortality losses were more important in summer as compared to other seasons, the calves littered in the cold season having a better vitality and an increased resistance. The benefic influence of the environment in case of the calves housed in individual igloos is highlighted by the reduced percentage of mortality of only 3.76% for the entire livestock under study [3,5].

Similar researches in other counties from the Moldavian region [7] showed that the calves housed outside the barn registered daily average gains superior to the calves housed inside the barn, but also a higher specific consumption. This may be explained by the influence of the healthy climate lacking toxic substances in case of the calves housed outside.

Table 2 Daily average gain. Average values and estimates of variability for body weight depending on season

Season	Weight	Statistics n = 345						Daily average gain g/day
		\bar{X}	$\pm s \bar{x}$	s	V%	Min.	Max.	
Spring n=95	Body weight at birth	40.530	0.624	2.135	6.50	36.00	44.00	0.740
	Body weight at 30 days	62.730	0.756	3.730	8.17	53.00	74.00	
mortality	2 calves							
Summer n=75	Body weight at birth	38.823	0.468	1.973	6.73	34.00	41.00	0.695
	Body weight at 30 days	59.691	0.827	4.507	7.97	51.00	70.00	
mortality	6 calves							
Autumn n=85	Body weight at birth	40.680	0.378	3.287	6.80	35.00	44.00	0.743
	Body weight at 30 days	63.091	0.633	3.255	8.32	52.00	75.00	
mortality	2 calves							
Winter n=90	Body weight at birth	40.730	0.837	3.965	6.93	37	45	0.756
	Body weight at 30 days	63.430	0.877	4.353	8.72	53.00	76.00	
mortality	3 calves							

Table 3 Daily average gain. Average values and estimates of variability for body development for the entire livestock under study

Weight	Statistics n = 345						Daily average gain g/day
	\bar{X}	$\pm s \bar{x}$	s	V%	Min.	Max.	
Body weight at birth	40.57	0.752	4.194	7.130	34.00	45.00	0.758
Body weight at 30 days	63.32	0.826	4.536	8.397	51.00	76.00	

Depending on the products' sex (tab. 4) differences were highly significant, namely 0.711 g/day in females and 0.762g /day in males. At the same time, at the age of 30

days the females had the body weight of 59.47 kg and males had 63.57 kg. The size registered 85.5 cm in females and 88.69 cm in males.

Table 4 Daily average gain. Average values and estimates of variability for body development at the age of 30 days depending on sex

Sex	Character	\bar{X}	$\pm s \bar{X}$	s	V%	Min.	Max.	Daily average gain g/day
Females n= 168	Height at withers	85.50	0.827	3.203	3.974	78.00	89.00	0.711
	Height at back	85.57	0.523	2.024	2.448	79.00	89.00	
	Height at croup	85.53	0.872	3.378	4.044	78.00	90.00	
	Height at the basis of tail	85.43	0.745	2.883	3.508	77.00	88.00	
	Oblique length	69.33	1.523	5.900	8.510	59.00	76.00	
	Horizontal length	67.27	1.361	5.271	7.954	60.00	75.00	
	Total length	87.20	0.917	3.550	4.071	81.00	96.00	
	Thorax length	38.13	1.226	4.749	12.454	31.00	47.00	
	Head length	23.13	0.389	1.506	6.508	20.00	25.00	
	Chest length	22.67	0.433	1.676	7.395	20.00	26.00	
	Thorax perimeter	85.73	1.270	4.920	5.379	77.00	91.00	
	Weight at birth	38.13	0.904	3.502	8.234	34.00	44.00	
	Weight after 30 days	59.47	0.975	3.777	5.914	51.00	72.00	
Males n=177	Height at withers	88.69	0.564	1.691	2.041	80.00	90.00	0.762
	Height at back	88.78	0.846	2.539	2.994	81.00	90.00	
	Height at croup	88.71	0.935	2.804	3.256	80.00	91.00	
	Height at the basis of tail	88.53	0.764	2.291	2.761	80.00	88.00	
	Oblique length	72.89	1.695	5.085	6.977	62.00	77.00	
	Horizontal length	69.33	1.453	4.359	6.287	64.00	76.00	
	Total length	92.11	1.837	5.510	5.982	85.00	101.00	
	Thorax length	44.44	2.873	8.618	19.392	37.00	57.00	
	Head length	25.11	0.676	2.028	8.074	21.00	28.00	
	Chest length	23.00	0.745	2.236	9.722	20.00	27.00	
	Thorax perimeter	88.00	1.354	4.062	4.616	83.00	94.00	
	Weight at birth	40.69	1.495	4.485	7.726	37.00	45.00	
	Weight after 30 days	63.57	1.614	4.842	5.744	55.00	76.00	

CONCLUSIONS

The conclusion that may be drawn from this experiment is that the technology of raising calves in igloos nestled outside the barn has benefic influences on the body

development and health state and it may be practiced in the farms from the Moldavian area located in less favorable climatic conditions.

This technology may also be used in other regions having less favorable climatic conditions and breeds sensitive to the farming conditions (such as the Friesian type).

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