

# The incidence of difficult calvings in the beef cattle in the Slovak Republic

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Article Details: Received: 2018-05-04 | Accepted: 2018-05-14 | Available online: 2018-11-26

<https://doi.org/10.15414/afz.2018.21.04.135-137>



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Calving difficulty is one of important economic traits in beef production. In the Slovak Republic calving difficulty in beef cattle is recorded on the regular basis, however, these data have not been used so far in decision making. The aim of this study was to get the first insight into the data. Data on 288 346 calvings in 5 major Slovak populations (Charolais, Limousine, Slovak Simmental, Pinzgau, Beef Simmental) during the period 1990–2017 were exploited. The primary analyses showed that there exist differences in the incidence of the difficult calvings according to the breed of the dam. The lowest rate of assisted calvings was observed in Limousine breed. Lower incidence was observed when calvings of crossbred matings were considered. Only slight associations of difficult calvings with sex of calves, parity and season of calvings were observed. Slightly higher rates of assisted calvings were observed in the group of heifers and births of males.

**Keywords:** beef cattle, calving ease, dystocia, reproduction

## 1 Introduction

Calving difficulty is considered very important reproduction trait. It affects the economics of the breeding directly through costs for the labor and veterinarian assistance and indirectly through the consequent production and fertility of the cow and calf (López de Maturana et al., 2007, Atashi et al., 2012). The incidence of the difficult calvings varies across the populations. According to De Amicis et al. (2018) incidence of difficult calvings is more frequent in dairy cattle. In the beef cattle authors reported 6.6% and 6.2% of difficult calvings in Charolais and Hereford primiparous cows (Eriksson et al., 2004), 3.7% of difficult calvings in Canadian Simmental (Jamrozik and Miller, 2014). It was showed that difference in incidence exists between primiparous and multiparous cows (Fuerst and Egger-Danner, 2003). Some authors Môtus et al. (2017), Juozaitiene et al. (2017) even reported increased incidence of difficult calvings after the second one.

In the Slovak Republic the calving difficulty in beef cattle is part of the performance recording, however, these data are not used in the genetic evaluation. This study presents the first insight into the data in order to make further decisions on its use.

## 2 Materials and methods

The data on beef cattle performance recording are collected by the Breeding Services of the SR, s.e, and provided to the Institute of Animal Production Nitra on regular basis. In this study the data on 288,346 calvings in 5 major Slovak populations (Charolais, Limousine, Slovak Simmental, Pinzgau, Beef Simmental) during the period 1990–2017 were exploited. The calvings of twins were excluded from this analysis.

The recording of the calving difficulty in the Slovak Republic is based on the four-point scale with 1 referring to easy calving (no assistance needed) and 4 referring to caesarian section, and with additional category 0 referring to unobserved calving. Based on the practice the unobserved calvings ( $n = 19,383$ ) were included in easy calvings category (Phocas and Laloë, 2004). Based on published findings (Carnier et al., 2000, Steinbock et al., 2003), distinction was made between the first and later calvings. Females, which gave first birth by the age of 3 years were considered heifers and females which gave consecutive birth (first birth record was available) were considered multiparous cows. There were 75,734 calvings, where the parity was doubtful. These were mainly cows with the first recorded birth at higher age,

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which could result from moving animals from dairy to beef herd, or abortion (not recorded).

The incidence of difficult calvings according to sex (males, females), parity (heifers, cows) and season (spring, summer, autumn, winter) was tested by chi-square test within SAS software (Statistical Analysis System, Version 9.1, 2004). Since the large sample size was used and high significant levels were expected, the Cramers` V test was also applied to obtain strength of associations.

### 3 Results and discussion

The incidence of difficult calvings according to the breed of dam is summarized in Table 1. It is obvious that the most of the calvings were recorded as easy and overall only 4.9% of calvings required some form of assistance. When comparing the incidence of difficult calvings

among the breeds (purebred) the lowest rate of calvings requiring assistance was observed in Limousine (5.1%). In other three breeds incidence of these calvings was similar (6.2–7.7%). The incidence of calvings requiring assistance was lower in all breeds when crossbred matings were compared.

Due to large sample size statistical significance of chi-square is doubtful. The Cramers` V test showed that there are only very weak associations between the difficulty of calvings and the sex of calves (0.028), parity (0.036) and season (0.011). Indeed, when comparing the calvings according to the sex of calves, only slight difference was observed between the births of males and females (5.43% vs. 4.22%). This observation is in agreement with findings, that the males are born heavier and incidence

**Table 1** The distribution of calvings

		1 (no assistance)	2 (slight assistance)	3 (major assistance)	4 (caesarian)
Charolais	Pure <sup>a</sup>	7,663	521	38	3
	Cross <sup>b</sup>	79,508	4,060	290	12
Limousine	Pure	5,966	293	24	2
	Cross	75,676	3,138	220	18
Slovak Simmental	Pure	15,212	940	34	0
	Cross	68,167	2,923	93	3
Pinzgau	Pure	3,199	241	11	1
	Cross	7,050	290	17	1
Beef Simmental	Pure	1,148	76	9	1
	Cross	11,039	443	16	0
Total		274,628	12,925	752	41

<sup>a</sup> – calvings from matings of purebred bulls to females with max 12.5% of foreign blood, <sup>b</sup> – calvings from matings of purebred bulls to females with more than 12.5% of foreign blood

**Table 2** Distribution of calvings according to sex, parity and season

	1 (no assistance)	2 (slight assistance)	3 (major assistance)	4 (caesarian)
Sex				
Males	121,328	6,540	401	23
Females	153,300	6,385	351	18
Parity				
Heifers	67,982	4,403	319	20
Cows	133,735	5,863	276	14
Season				
Spring <sup>a</sup>	121,062	6,043	362	21
Summer <sup>b</sup>	55,894	2,820	150	5
Autumn <sup>c</sup>	27,428	1,201	74	1
Winter <sup>d</sup>	70,244	2,861	166	14

a – February–April, b – May–July, c – August–October, d – November–January

of difficult calvings is higher in this group (Atashi et al., 2012, McHugh et al., 2014).

The similar pattern was observed when parity of calving was considered. Slightly higher incidence of the difficult calvings was observed in heifers (6.52%) compared to multiparous cows (4.4%). Higher incidence of difficult calvings in heifers was similar to those reported in beef populations by Eriksson et al. (2004). Higher rates of assisted calvings in beef populations were reported by Phocas, F. and Laloë, D. (2004).

Negligible difference in the incidence of difficult calvings among seasons was observed. Authors (Uematsu et al., 2013; Mekonnen and Moges, 2016) reported higher incidence of difficult calvings in the winter and spring period. However, this was not observed in our study. Moreover, the lowest incidence was observed in the winter. This could result from keeping the beef cattle in barns during this period and allowing better control during calvings.

#### 4 Conclusions

The overall incidence of 4.9% was observed in the 5 major populations in the Slovak Republic. Slight differences in the incidence were observed among the breeds. Also only slight differences in the incidence were observed between the difficult calvings and the sex of calves, parity and season of the calving. Further analysis including other smaller beef populations and analysis of herd management on the calving difficulty will follow.

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