Health Status of Beef Cows and their Calves in the Czech Republic

Petr Slavík[1], Josef Illek[2], Michal Brix, Lucie Musilová[1], Radko Rajmon[1], Petra Klabanová[1], František Jílek[1]

[1]Department of Veterinary Sciences, Czech University of Life Sciences Prague, Czech Republic
[2]Clinic of Ruminant Diseases, University of Veterinary and Pharmaceutical Sciences Brno, Czech Republic

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Abstract

The objective of this study was to assess the health status and the most common health problems occurring in beef cattle in the Czech Republic.

Thirty five beef herds of different breeds were monitored from 1 January to 31 December 2006. The health status of 4872 animals (2601 cows and 2271 of their calves) was analyzed. Herds of up to 50 cows and those over 50 cows were evaluated both separately and together. Farm management data were collected by means of a questionnaire completed by the farmers. Both geographic and herd characteristics were evaluated, as well as the course of calving, mortality and morbidity in calves, and disease occurrence in cows. Calving was unassisted in about 80% of the cows, and the conception rate was approximately 90%. More difficult courses of calving were reported from the small herds than from the large ones ($p < 0.001$). Total calf losses were 10% on the average. Most calf deaths occurred during the first week of life ($p < 0.01$), the most common cause of death being diarrhoea ($p < 0.001$). The situation was similar in large and small herds. Diarrhoea was also most often diagnosed in those calves that survived the early life stage. At the age of 120 days, the calves that had suffered from diarrhoea showed a lower body weight by 12.6 kg than the calves of the same age from the same herd that did not have diarrhoea. The occurrence of diarrhoea in small and large herds was 12.1% and 6.7% per herd, respectively ($p < 0.05$). Also, other health disorders were more often reported from small herds, in calves as well as in adult cows ($p < 0.001$).

Beef cattle, herd management, calf, diarrhoea, respiratory diseases, metabolic disorders

Productivity in the cow-calf industry depends on the number and weight of weaning calves. These measures are a function of herd reproductive efficiency and calf growth, mortality and morbidity. However, all of this depends on many factors including management, diseases, dystocia, weather, geographic location, and genetics (Bailey 1981). It is also necessary to take good care of dams as regards maintaining good health status and fertility up to the highest possible age. Awareness of the most common health problems is important for cow/calf producers and veterinarians for the establishment of management strategies and health programmes to decrease economic losses associated with cow/calf morbidity and calf mortality (Wittum et al. 1994a).

The objective of this study was to describe the incidence of diseases and morbidity and mortality of beef cows and calves from birth to 6 months of age in a sample of Czech beef herds.

Materials and Methods

Population under study

All the herds monitored in this study were included in the health and production recording program which is supervised by the professional organization Czech Beef Breeders Association (ČSCHMS). The data were collected from 35 beef herds. In all, 4872 calves and cows of 6 breeds (Aberdeen Angus, Charolais, Hereford, Beef Simmental, Piemontaise, Blonde d'Aquitaine) were studied. The data were collected in the production year 2005/2006. The herds represented the main areas of extensive cattle rearing in the Czech Republic (the Sumava - Bohemian Forest, the Bohemian-Moravian Highlands, North Moravia, West Bohemia, the Ore Mountains, the foothills of the Giant Mountains, South Bohemia, and East Bohemia), i.e., mainly mountain and submontane areas. The animals were reared in an extensive way with maximum utilization of pasture.

Address for correspondence:
MVDr. Petr Slavík, Ph.D.
Czech University of Life Sciences Prague
Department of Veterinary Sciences
Kamýcká 129
165 21 Prague 6, Czech Republic

Phone: +420 224382948, +420 607 727 743
E-mail:slavik.pe@seznam.cz
http://www.vfu.cz/acta-vet/actavet.htm

Data collection

On the basis of preliminary consultations with the Czech Beef Breeders Association and some departments at the University of Veterinary and Pharmaceutical Sciences Brno (CZ), at the turn of the years 2005/2006, selected farmers were addressed and informed about the project, its assumed course and objectives. Of the farmers who agreed to provide the data, some were selected to be evenly distributed over the entire Czech territory. Other selection criteria for choosing representative farms were the average number of animals in the herd and the area of cultivated land.

Afterwards, a questionnaire concerning the health status of animals kept on each farm was compiled in accordance with Dutil et al. (1999) and Busato et al. (1997) and sent to the farmers by electronic mail. The questionnaire ascertained the numbers of animals at individual farms, numbers of animals in different production stages, geographic location of the farm, difficulty during the course of calving, number, age, and symptomatology of calves that had died, and simple records of new diseases in calves and cows. Afterwards, the farms were divided according to size into two basic categories, i.e., small herds - less than 50 cows and large herds - more than 50 cows.

Data storage, validation and statistical analysis

The farmers sent their reports by e-mail once a month. Unclear or inaccurate data were immediately corrected. The monitoring was completed in December 2006.

The assessment of calving difficulty was determined according to an international four degree scale (Nix et al. 1998; Sanderson and Dargatz 2000). Score 1 represents spontaneous calving, score 2 - calving with slight human assistance, score 3 - calving requiring the presence of a veterinarian, score 4 - Caesarean section.

Disease occurrence was recorded by farmers and project veterinarians who examined the animals clinically. During their visits, the veterinarians clinically examined (at least twice a week) all the sick animals. Cases that showed looser faeces than normal for longer than ≥ 2 days were designated as diarrhoea. Omphalophlebitis was defined as a warm swelling or abscess formation associated with the navel. Respiratory diseases were defined as coughing or sneezing for ≥ 2 days, or severely increased respiratory sounds at lung auscultation, or moderately increased respiratory sounds along with additional sings such as coughing or increased nasal discharge (Svensson et al. 2003). The category "sepsis" included mainly animals with a sudden onset of the disease that died and usually showed high body temperature and joint swelling but did not show typical signs, or the clinical signs that they showed indicated that several body organs were affected. Low viability was characterized by muscle weakness, malaise, fatigue and lethargy (body temperature was not increased). The category "puerperium disorders" included mostly retained placenta and metritis.

Live weights were ascertained from the data collected by the production recording, carried out by the Czech Beef Breeders Association at an average animal age of 120 days.

The effect of the herd size was tested using a general linear model. The numbers of cases observed were examined by the χ^2 test (where applicable) and a two sample test on relative frequencies (2 × 2 table). Incidences of individual disorders in % were calculated on the level of the entire population as well as on the level of individual herds - these being presented as the mean incidences per herd. Those last indicators were tested by the multivariate ANOVA procedure (MANOVA) with subsequent post-hoc testing (Scheffe's test). Other effects, such as the effect of age or disease on calf losses, or the effect of diarrhoea on live weights were tested by ANOVA, with subsequent post-hoc testing if necessary. The onsets of diarrhoea and respiratory diseases in calves was compared using Kruskal-Wallis test. Differences with the consonance probability $p < 0.05$ were considered significant. Statistical analyses were performed using Statistica v.8 (Statsoft) software.

Results

Characteristics of the farms under study are shown in Table 1. The average herd size was 116.7 (S.D. 159.4) animals in total and 65.9 (SD 79.2) cows. The largest share of farms under study was located in mountain and submontane regions (300–700 m above sea level).

Table 1. Geographic and management characteristics of the herds

Herd size		Below 50 heads		Above 50 heads		All herds	
		No.	%	No.	%	No.	%
No. of herds		14	40	21	60	35	100
Total No. of cattle		521	11	4025	89	4546	100
No. of cows		337	13	2264	87	2601	100
Total calves born		309	14	1962	86	2271	100
Altitude (m above sea level)	up to 300	0	0	1	8	1	5
	300-700	10	70	17	76	27	74
	above 700	4	30	3	16	7	21

Table 2. Numbers of cows calving (related to all the cows kept) and calving difficulty (related to all the cows calving in total or in individual herds). Small and large herds significantly differ ($p < 0.001$; χ^2 test, MANOVA)

Herd size	Below 50 heads (n = 14)				Above 50 heads (n = 21)				All herds (n = 35)			
	Total cows		ø per herd		Total cows		ø per herd		Total cows		ø per herd	
Calving difficulty	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
I	249	80.6	17.8	81.8	1550	79.0	73.8	79.0	1799	79.2	51.4	80.1
II	37^{A}	12.0	2.9	12.2^{1}	337^{B}	17.2	16.0	17.6^{2}	374	16.4	10.7	15.4
III	21^{a}	6.8	2.1	5.4	69^{b}	3.5	3.3	3.2	90	4.0	2.6	4.1
IV	2	0.6	0.4	0.6	6	0.3	1.5	0.2	8	0.4	0.2	0.4
No. of calving cows	309	91.7	22.1	92.69	1962	86.7	93.4	86.66	2271	87.3	64.9	89.07

^{a,b}, ^{A,B} - values designated with different superscripts within a row differ at $p < 0.05$ and $p < 0.01$ (two sample tests on relative frequencies)

^{1,2} values designated with different superscripts within a row differ at $p < 0.01$ (MANOVA, Scheffe's test)

Calving was unassisted in about 80% of cows, and the conception rate was approximately 90%. Among the herds of up to 50 cows, score 4 of calving difficulty - Caesarean section - was observed in two herds, and among the herds with over 50 cows in 3 herds, so that the incidences were similar in both herd categories. Nevertheless, score 3 was more frequent in the small herds and score 2 in the large herds. Therefore, calving difficulty in the small and large herds generally differed highly significantly ($p < 0.001$, χ^2 test, MANOVA). For score 2 frequency, the difference between large and small herds was found significant *($p < 0.01$)* by means of two selection tests on relative frequencies, as well as for score 3 *($p < 0.05$)*. According to Scheffe's test, the mean incidences per herd differed significantly *($p < 0.05$)* in score 2 only (Table 2).

Calf mortality did not differ significantly between small and large farms at any period evaluated. The greatest losses were observed during the first week of life. This tendency was significant among the small as well as the large herds. In the large herds even other periods differed significantly from one another ($p < 0.01$, Scheffe's test) (Table 3).

We also investigated the causes of death in live-born calves (Table 4). The total numbers of calves that died from various diseases (calf did not show clear signs of other diseases), as well as their incidence in small and large herds, and in all the herds together are given. The diagnosis was based on clinical signs. Aetiological agents could not be ascertained for organisational reasons. As with the general losses of calves, calf death causes were similar in small and large herds as well. The only difference between the herd categories determined as significant ($p < 0.05$, ANOVA*)* was in the mean herd incidences of "other" causes. Diarrhoea was found to be highly significantly the most frequent cause of calf

Table 3. Losses of calves in different periods postpartum (incidences related to all calves born in total or in individual herds)

Herd size	Below 50 heads (n = 14)				Above 50 heads (n = 21)				All herds (n = 35)			
	Total cows		ø per herd		Total cows		ø per herd		Total cows		ø per herd	
Losses of calves	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Up to 1 week of age	20	6.47	1.43	5.50$'$	126	6.42	6.00	6.43$'$	146	6.43	4.17	6.06$'$
2–4 weeks of age	7	2.27	0.50	1.95$''$	59	3.01	2.81	2.77$''$	66	2.90	1.88	2.44$''$
Up to 6 months	4	1.29	0.29	1.11$''$	20	1.02	0.95	1.07$''$	24	1.06	0.69	1.83$''$
Stillborn	2	0.65	0.14	0.55$''$	8	0.41	0.38	0.34$''$	10	0.44	0.29	0.43$''$
Total	33	10.68	2.36	9.11	213	10.86	10.14	10.61	246	10.83	7.03	10.01

$'$,$''$ Values designated with different superscripts within a column differ at $p < 0.01$ (ANOVA, Scheffe's test)

Table 4. Losses of live born calves due to different diseases (incidences related to all calves live born in total or in individual herds)

Herd size	Below 50 heads (n = 14)				Above 50 heads (n = 21)				All herds (n = 35)			
	Total cows		ø per herd		Total cows		ø per herd		Total cows		ø per herd	
Losses due to	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Diarrhoea	21	6.84	1.50	5.87′	133	6.86	6.38	6.58′	154	6.86	4.43	6.18′
Respiratory diseases	3	0.98	0.21	0.73′′	19	0.97	0.91	0.94′′	22	0.97	0.63	0.83′′
Omphalitis	4	1.31	0.29	1.10′′	20	1.02	0.95	1.16′′	24	1.06	0.68	1.01′′
Low viability	2	0.65	0.14	0.67′′	8	0.41	0.38	0.44′′	10	0.44	0.29	0.50′′
Others	1	0.32	0.07	0.19[1′′]	25	1.28	1.19	1.23[2′′]	26	1.15	0.74	0.79′′
Total	31	10.10	2.21	8.56′′	205	10.54	9.81	10.35′′	236	10.48	6.77	9.31′′

[1,2] Values designated with different superscripts within a row differ at $p < 0.01$ (ANOVA)
′,′′ Values designated with different superscripts within a column differ at $p < 0.01$ (ANOVA, Scheffe's test)

Table 5. Most frequent diseases in surviving calves (incidences related to all calves surviving up to 6 month of age in total or in individual herds)
Small and large herds significantly differ ($p < 0.001$; χ^2 test, MANOVA)

Herd size	Below 50 heads (n = 14)				Above 50 heads (n = 21)				All herds (n = 35)			
	Total calves		ø per herd		Total calves		ø per herd		Total calves		ø per herd	
Disease	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Diarrhoea	25	9.06	1.79	12.08[I]	118	6.75	5.62	6.69[II]	143	7.06	4.09	8.85
Respiratory diseases	8	2.90	0.57	3.60	41	2.35	1.95	2.43	49	2.42	1.40	2.90
Omphalitis	13[A]	4.71	0.93	4.90[I]	34[B]	1.94	1.62	2.05[II]	47	2.32	1.34	3.19
Sepsis	7[A]	2.54	0.50	2.81[1]	13[B]	0.74	0.62	0.68[II]	20	0.99	0.57	1.53
Low viability	11[a]	3.98	0.79	4.91	34[b]	1.94	1.62	2.23	45	2.22	1.29	3.29
Others	10	3.62	0.71	4.13	46	2.63	2.19	3.16	56	2.77	1.60	3.55
Total	74[A]	26.81	5.29	32.43[1]	286[B]	16.35	13.62	17.24[2]	360	17.78	10.29	23.31

[a,b], [A,B] - values designated with different superscripts within a row differ at $p < 0.05$ and $p < 0.01$ (two sample test on relative frequencies)
[I,II], [1,2] - values designated with different superscripts within a row differ at $p < 0.05$ and $p < 0.01$ (MANOVA, Scheffe's test)
Diarrhoea mean incidence differ significantly from other disease incidences at each herd category ($p < 0.001$, ANOVA, Scheffe's test) - not indicated.

deaths ($p < 0.001$, Scheffe's test) in both herd categories.

For calves that showed disease signs but did not die, the diagnosis was determined on the basis of clinical examination. Table 5 gives the numbers of animals suffering from different diseases and their proportion to the total of surviving calves in small and large herds, and in the herds in total. In the case of omphalophlebitis, however, the results sometimes depended on when the disease was diagnosed. For some diseases, clinical signs were rather similar, or one disease was underlying another (omphalophlebitis - sepsis).

The effect of the herd category was found highly significant ($p < 0.001$, χ^2 test, MANOVA). Calves were significantly more often reported sick in the small herds than in the large ones. This trend appeared in all disease categories, and for diarrhoea, omphalitis, sepsis, and low viability, the differences were significant in at least one of the indicators tested - the number of cases observed in the population (two sample test of relative frequencies) or the mean herd incidence (Scheffe's test). Diarrhoea was

Table 6. Most frequent diseases in cows (incidences related to all the cows kept in total or in individual herds) Small and large herds significantly differ ($p < 0.001$; χ^2 test, MANOVA)

Herd size	Below 50 heads (n = 14)				Above 50 heads (n = 21)				All herds (n = 35)			
	Total cows		ø per herd		Total cows		ø per herd		Total cows		ø per herd	
Disease	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Diarrhoea	22^{A}	6.53	1.57	7.22^{I}	75^{B}	3.31	3.57	3.82^{2}	97	3.73	2.77	4.85
Respiratory diseases	27^{A}	8.01	1.93	9.45^{I}	81^{B}	3.58	3.86	4.13^{2}	108	4.15	3.09	5.90
Mastitis	12^{A}	3.56	0.86	4.05^{I}	30^{B}	1.33	1.43	1.53^{2}	42	1.62	1.20	2.49
Locomotory system	19^{a}	5.64	1.35	6.36^{I}	77^{b}	3.40	3.67	3.93^{II}	96	3.69	2.74	4.60
Metabolic disorders	22^{a}	6.53	1.57	5.84^{I}	81^{b}	3.58	3.86	4.13^{II}	103	3.96	2.94	4.52
Puerperal disorders	14	4.15	1.00	4.63	87	3.84	4.14	4.43	101	3.88	2.89	4.19
Others	12^{a}	3.56	0.86	3.22	41^{b}	1.81	1.95	2.09	53	2.04	1.51	2.40
Total	128^{A}	37.98	9.14	40.78^{I}	472^{B}	20.85	22.48	24.06^{2}	600	23.07	17.14	28.95

^{a,b}, ^{A,B} - values designated with different superscripts within a row differ at $p < 0.05$, and $p < 0.01$ (two sample test on relative frequencies)

^{I,II}, ^{1,2} - values designated with different superscripts within a row differ at $p < 0.05$ and $p < 0.01$ (MANOVA, Scheffe's test)

highly significantly the most frequent disease ($p < 0.001$, Scheffe's test) both in large and small herds (Table 5).

Moreover, diarrhoea was diagnosed at a significantly lower age (median 13 days) than respiratory diseases (median 35 days) were ($p \leq 0.01$, Kruskal-Wallis test). Calves that suffered from diarrhoea at early stages of life weighed 12.6 kg less at the age of 120 days than calves of the same age from the same herd that did not previously suffer from diarrhoea ($p < 0.01$, ANOVA for repeated measures). In addition, in more than 50% of calf sickness, a second visit of a veterinarian was necessary.

In the case of monitoring the most frequent diseases in breeding cows (Table 6), it was not possible in most cases to determine the aetiological agents. The diagnosis was determined based on the characteristic clinical signs. Mastitis was diagnosed according to visible clinical signs. All hoof disorders were designated as locomotor system diseases (horn quality and the occurrence of specific lesions). The category of metabolic disorders included all the diseases leading to the "downer cow" syndrome, as well as disorders of acid-base balance. Puerperium disorders were included in the statistics only if therapeutic intervention was required. In most cases it was retained placenta, invagination and prolapse of the vulva and uterus, incomplete lochia expulsion and diagnosed inflammations. The category "Others" included diseases with uncertain diagnosis, traumas and force majeure. The effect of the herd size was highly significant for the number of cases observed in the population as well as for the mean herd incidence ($p < 0.001$, χ^2 test, MANOVA). Similarly to calves, cow health disorders were significantly more often detected in small herds ($p < 0.01$, two sample test of relative frequencies, Scheffe's test). This trend was observed in all disease categories, except for puerperal disorders, where the differences were significant by at least at one of the indicators tested - the number of cases observed in the population (two sample test on relative frequencies) or the mean herd incidence (Scheffe's test), predominantly with $p < 0.01$ (Table 6). Also, the mean incidence of various diseases differed highly significantly among each herd category ($p < 0.001$, ANOVA). Nevertheless, their mutual relations were much less transparent compared to calves, where diarrhoea clearly dominated.

Discussion

At present, about 140,000 cows without market milk production are reared in the Czech Republic. In all, about 500,000 head of cattle are reared in this system. The mean number

of cows per herd is 69 (Holá 2006). Also in this study (Table 1) those farms that raise over 50 animals predominate and the average number of cows per herd is similar. In general in our country, beef cattle farming is in a completely different situation than for example, in Switzerland, where the mean farm size is 16 cows (Busato et al. 1997). Furthermore, Table 1 shows that this type of cattle farming is concentrated mainly at altitudes of 300 m above sea level, which is in accordance with the philosophy and purpose of the industry.

For the evaluation of calving (Table 2), a scheme by Nix et al. (1998) and Sanderson and Dargatz (2000) was used. Relatively few calving difficulties were observed. The data are similar to the results of the survey published by Busato et al. (1997), who found 88.3% of normal calving. Calving difficulty is one of the parameters assessed in production records and is - among others - influenced by breed strains. In this study, the animals did not belong to the same breed. However, we believe that the sets of animals were large enough to minimize the effect of the breed on this parameter. Similarly to Dutil et al. (1999), we determined that more difficult calvings were observed in smaller herds. Nevertheless, the difference was based on the ratio of score 2 (slight assistance) and score 3 (requiring veterinary assistance) calvings only. There were no differences in the score 1 or 4 calvings related to the herd size. It is generally assumed that the stock personnel are less aware of individual animals and take less individual care in large herds. Also, better experience in delivery assistance can be of importance.

Differences in total calf losses in different periods post partum were not observed between the small and large herds (Table 3). Dutil et al. (1999) reported the losses in calves due to diarrhoea at 18.6% and those due to respiratory problems, 12.8% (in herds up to 40 head). In the herds over 40 heads, it was 28.5% (diarrhoea) and 18.6% (respiratory problems). A clear difference between large and small herds can be seen here. In this study we did not manage to demonstrate such a significant trend.

The significant majority of calf deaths reported occurred during the first week of life ($p < 0.01$). In all, according to our results, 10.8% of live born calves died. The values, however, show a great variation, indicating that there are great differences in calf mortality among the herds. The mortality percentages vary considerably between the results reported as well. The mortality percentage reported ranges from 0–90% (Beger 2001; Busato et al. 1997; Dooley 1982; Dutil et al. 1999; Wittum et al. 1993). However, we lack data indicating in which period the losses were the highest. The differences between the periods are due to different sizes of herds under study, rearing technologies, breeds, and last but not least, business environment (subsidies in Europe are not usually directed towards livestock production but rather to areas of cultivated land). Therefore, some farmers do not pay enough attention to this problem. For instance, mortality of 10% is considered as a serious problem even in herds reared extensively in the U.S.A. (Wittum et al. 1993). Therefore, there is a potential to favourably influence the herd economy by decreasing mortality.

The greatest losses were caused by diarrhoea, over 60%, as shown in Table 4 ($p < 0.001$). The table data are supplemented by Fig. 1, which clearly shows that the highest percentage of deaths in calves is due to diarrhoea. This demonstrates the direction in which veterinary practice should be heading. Wittum et al. (1993) and Busato et al. (1997) found a much lower share of diarrhoea (13.3% and 15.9%, respectively) in total losses. On the contrary, Wittum et al. (1993) considered deaths due to difficulties during calving (12.4%) as a great problem. Only 8% of the total number of deaths was due to respiratory problems. Busato et al. (1997) pointed out respiratory problems as the cause of death in 52.3% of animals. Svensson et al. (2003) reported that calves suffered from diarrhoea usually in the first four weeks of life. In general, American data are rather different from the European. It is possible that the differences are due to the fact that in the U.S.A., unlike Europe, the fight

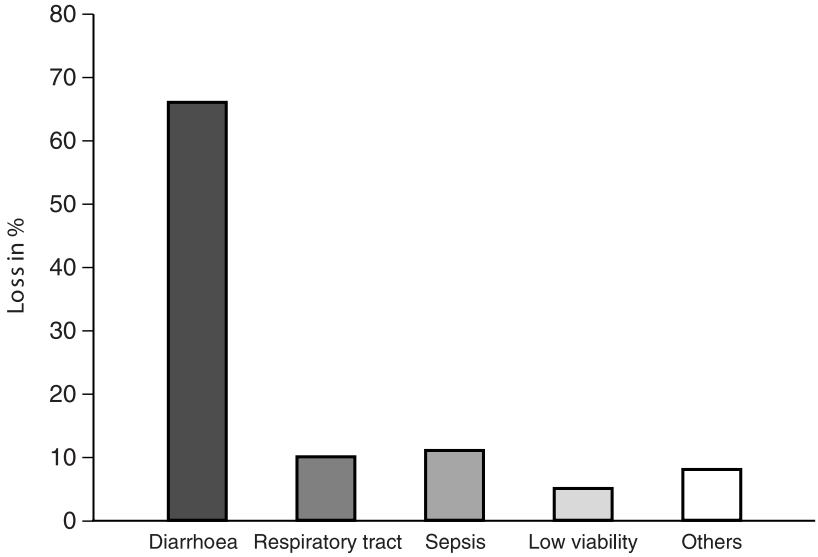

Fig. 1. Losses of live born calves due to different diseases

against infection is based mainly on vaccination, thereby preventing to a certain extent the development of some diseases.

Interestingly, a significant effect of the herd size ($p < 0.05$) was found only in the category "Others", where a greater incidence was observed in the large herds. The diagnosis was based on characteristic clinical signs for a given disease. Aetiological agents were not ascertained in most cases. This may also be associated with a lower awareness of the herd stockmen because this category included various injuries, accidents, losses of animals, or accidents such as lightening strikes.

In contrast to calf mortality, we found a highly significant effect of the herd category on calf morbidity ($p < 0.001$). Calves were significantly more often reported sick in small herds than in large ones. This trend appeared in all disease categories (Table 5). If we take into account equal calf mortality in small and large herds, the difference can at least in part probably be a result of less individual care in large herds.

Diarrhoea is a great problem in surviving calves - it was highly significantly the most frequent disease ($p < 0.001$), representing about 30% of reported cases in both large and small herds. Most authors rank diarrhoea the highest in disease incidence in calves and report much higher percentages than we found (Laiblin and Metzner 1996; Beger 2001; Busato 1997). These reports, however, are not consistent. Laiblin and Metzner (1996) cite respiratory problems as the second most frequent disease in calves (37.6%). On the contrary, Beger (2001) reported only 9.5% for this disease. In this study, diarrhoea alone maintains a dominant position and respiratory disease incidence does not differ substantially from others, but it is also possible that in some cases infection of the respiratory tract can be attributed to sepsis or low viability.

Moreover, diarrhoea was diagnosed at a significantly lower age (median 13 days) than the respiratory diseases (median 35 days), ($p \leq 0.01$). Svensson et al. (2003) also reported a higher occurrence of diarrhoea at a lower age than that of respiratory diseases. Nevertheless, the animals in this study suffered from diarrhoea much earlier. The time of diarrhoea occurrence indicates mixed cryptosporidium and coccidia infections.

In such cases it is possible to intervene effectively and decrease the incidence of the disease.

Based on production recording, calves that suffered from diarrhoea at an early stage of life weighed 12.6 kg less at the age of 120 days than calves of the same age from the same herd that had not previously had diarrhoea ($p < 0.01$). In addition, in more than 50% of calf sicknesses, a second visit of the veterinarian was necessary. Wittum et al. (1994b) showed a 15.9 kg reduction in calf weaning weight among calves experiencing general morbidity from birth to 45 days of age. Wittum and Perino (1995) duplicated this result; they demonstrated a 16 kg reduction in weaning weight among calves experiencing morbidity incidence from birth to 28 days of age.

Furthermore, we determined that in 50% of the cases of calves with diarrhoea, a second visit of the veterinarian was necessary, which further increased economic losses for the farmer.

Similar to morbidity in calves, cow morbidity was also reported more often from the small herds ($p < 0.001$). Nevertheless, there was no clearly dominant disease in the cows. In small herds and in the total population respiratory diseases were slightly more frequent, but in large herds puerperal disorders were slightly higher. Similarly, mastitis was rather less frequent (Table 6). Metabolic disorders were represented mostly by hypocalcaemia and hypomagnesaemia. This situation could have been caused mainly by marginal mineral status and poor management. Another problem is hoof disorders, which are more common in small herds. Not much data can be found in literature on hoof diseases in these cattle production stages. The reported frequency of hoof diseases is in accordance with our findings (Empel et al. 1990). On the other hand, we can state that hoof disorders in these production stages are caused mainly by inadequate nutrition or poor management, because grazing cattle are not influenced by inadequate environmental conditions in this respect, as reported for instance by Broom and Corke (2002).

The difference in the incidence of mastitis was probably due to the fact that in small herds lactating cows received more attention from stockmen. Tenhagen and Heuwieser (2006) reported that the incidence in different herds is very variable, and udder quarters with large teats are more predisposed to mastitis development than quarters with small teats. The incidence of mastitis was often observed towards the end of lactation, which is probably associated with a lower frequency of sucking. Most subclinical mastitis cases probably remain unnoticed. Laiblin and Metzner (1996) reported the incidence of mastitis at 13.3%, whereas Beger (2001), only at 6.7%. These studies, however, did not clearly state in which period of lactation the incidence was higher. Nevertheless, in our opinion, for a relevant assessment of the problem, it should be taken into account that most cattle without market milk production are crossbreds of combined breeds and therefore more susceptible to mastitis (as compared with purebred beef breeds).

In conclusion, the study covered a heterogeneous range of different typical cow-calf operations in the Czech Republic. The most significant pattern of cow and calf mortality and morbidity was described, and some information is now available about the frequency of disease and differences among rearing conditions.

Total calf losses were 10.8%, and over 60% of calf deaths occurred in the first week of life. The primary cause of death in calves was diarrhoea (60% of deaths). Diarrhoea was also the most common disease in surviving calves, followed by respiratory diseases and omphalitis. In adult cows, individual diseases occurred much more equally. Health disorders were more frequently reported from the smaller herds. Although specific farm conditions cannot be excluded, this study shows possibilities for improvement in herd management.

Zdravotní stav krav masných plemen a jejich telat v České republice

Cílem studie bylo zhodnotit na reprezentativním vzorku populace masného skotu v České republice zdravotní stav a nejčastější problémy, které se u těchto kategorií vyskytují.

Do naší studie bylo zařazeno třicet pět chovů masných plemen skotu. Zdravotní stav byl analyzován u 4872 zvířat (2601 krav a 2271 jejich telat) v období 1. ledna do 31. prosince 2006. Farmy do celkového počtu 50 zvířat (malé farmy) a nad 50 zvířat (velké farmy)byly hodnoceny jednak odděleně a jednak dohromady. Byla hodnocena geografická a zootechnická charakteristika chovů, obtížnost porodů, ztráty telat v důsledku jednotlivých onemocnění a v jednotlivých obdobích po porodu. A dále nejčastější onemocnění krav a telat v chovu.

Telení probíhalo spontánně asi u 80 % zvířat a otelilo se průměrně okolo 90 % chovných krav. Obtížnější průběh telení byl hlášen z malých farem *($p < 0{,}001$)*. Celkové ztráty telat dosahovaly průměrně 10.8 % a nejvíce úmrtí se vyskytlo během prvního týdne života *($p < 0{,}001$)*. Nejčastější příčinou smrti byla průjmová onemocnění *($p < 0{,}001$)*. Situace byla shodná jak v malých tak velkých chovech. Průjmová onemocnění byla také nejčastější diagnózou u přeživších telat.). Ve 120. dni věku telata, která trpěla průjmy, vážila o 12,6 kg méně než stejně stará telata ze stejného stáda, která neonemocněla. Incidence průjmových onemocnění telat byla průměrně 12,1% v malých a 6,7% ve velkých chovech ($p < 0{,}05$). Také další zdravotní problémy telat i krav byly častěji hlášeny z malých chovů *($p < 0{,}001$)*.

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