THE CAUSES OF CULLING IN BOHEMIAN PIED CATTLE AND CROSSES WITH THE RED HOLSTEIN AND AYRSHIRE BREEDS

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Abstract


In the present study, complete culling was investigated up to the 3rd lactation. The lowest percentage of culling was found in the CR crosses (Bohemian Pied X Red Holstein), in the CA (Bohemian Pied X Ayrshire) crosses it was slightly higher, while the percentage of culling was the highest in group C (Bohemian Pied cattle). That culling was markedly lower in the CR and CA crosses than in group C could be due to the heterose effect in the crosses.

In the individual breeding groups the dairy cows with the lowest efficiency were culled according to the sequence of lactation; the percentage of culling was the highest in dairy cows on the 3rd lactation, the percentage of CR crosses being lower (i.e. 53.57%) than of the CA crosses (i.e. 60.00%) and group C (i.e. 57.89%). Culling in the 3rd lactation due to disorders in reproduction was much lower, the lowest percentage being that of CR crosses (i.e. 3.57%). On the contrary, the highest percentage of culling in the 3rd lactation was found to be among the CR crosses and was due to diseases, functional disorders and morphological changes of the mammary gland (i.e. 25%). In the CR crosses the highest percentage of culling due to diseases of the locomotor organs occurred in the 2nd lactation (i.e. 33.33%) at the time when the cows were transferred to a cow shed with short stanchions and grated dunging pits.

Culling, Bohemian Pied cattle, crosses of the Bohemian Pied with the Red Holstein and Ayrshire cattle

In 1971, improvement crossing of the domestic cattle with the Red Holstein cattle of American-Canadian origin was begun in Czechoslovakia. The reason for selecting the Red Holstein breed was its high milk efficiency acquired abroad.

The aim of the present study was to carry out an evaluation of the commercially important indices of efficiency of the dairy cows and the degree and reasons for culling of crosses of Bohemian Pied cattle with Red
Holstein and Ayrshire breeds. Comparisons were then to be carried out with the Bohemian Pied cattle under conditions of the School Agricultural Enterprise of the University of Veterinary Science in Nový Jičín.

Studies of the reasons for culling are important from the aspect of health, production and rentability of the herd.

As concerns the complete culling of dams in the herd, Suchánek et al. (1972) found that culling of CA crosses during the 1st to 3rd lactation was by 2.3 - 37.3% lower as compared with the C group. Suchánek and Ulych (1975) found that the percentage of culling in the Bohemian Pied X Ayrshire crosses in the 1st lactation was by 5.2 - 15.8% lower than in group C. According to Suchánek and Ulych (1976) the degree of culling of CA crosses from the original number of cows was half of that of the herd mates of group C. Ulych and Suchánek (1977) report that culling in CA crosses was by 10% lower as compared with group C. Suchánek et al. (1980) investigated culling in CA crosses and found that it was by 4.4 - 21.8% lower than in the group C herd mates. Suchánek and Gołąba (1983) found that the total degree of culling of CR crosses was by 5.5 - 16.7% lower as compared with dams of group C. Suchánek (1982) reported that the degree of culling in CR crosses was by 8.5% lower than in the herd mates of group C. Jurčo (1985) observed a high percentage of culling, i.e. 38%, and in large-scale technologies even 41%. He confirmed the fact that high-efficiency dairy cows are culled especially due to disorders in fertility, diseases of the locomotor organs and diseases of the mammary gland. In the German Democratic Republic, Kiřst (1979) investigated the culling of cows in large-scale cow houses. The most frequent reason was selection according to efficiency, disorders in reproduction and diseases of the udder (i.e. 11.9, 10.2 and 7.1%, respectively). In Holland, Rennema and Stelwagen (1979) studied the reasons of culling in the Dutch Friesian cattle where disorders in reproduction, diseases of the udder and low efficiency were 25, 20 and 15%, respectively. Splipka and Hájč (1981) evaluated culling in the Bohemian Pied breed in the 2nd and following lactations. Due to low efficiency, infertility and diseases of the udder, 33.54, 27.34 and 8.45% of the total number of cows were culled, respectively. Suchánek and Božovský (1982) found that the degree of culling of CA crosses due to zootechnical reasons and/or due to low efficiency was low; the degree of culling due to zootechnical reasons and/or low efficiency was the highest in dairy cows of group C. Wołf (1982) reported that in the GDR the reasons for culling were low efficiency (38.7%), disorders in fertility (15.5%) and diseases of the udder (12.5%). Váchaň (1983) stated that the percentage of culling of the CR crosses in the 1st lactation due to various disorders of health was 7.6 - 11.7%, that in increased with the sequence of lactations and that it reached 14.6 - 19.1% in the 3rd lactation. Lotthammer (1984) studied the culling of cows in the period from 1978 to 1982 and he found that 29.3 to 30.9% of cows were culled due to disorders in fertility. According to Kadečka (1985) the basis for good reproduction is such a situation when culling due to disorders in reproduction is not higher than 10%. He reported that more than 25% of dairy cows are now being culled due to disorders of fertility. Král et al. (1977) reported that 10, 20% or even more of the culling is due to diseases of the locomotorm organs. Greenough et al. (1981) found that diseases of the limbs in cattle are on the 3rd and 4th place in causes of culling of dairy cows. The percentage of culling due to this disorder has reached as much as 40% in New Zealand, 1.5% in Great Britain, 3% in the FRG and in some countries as much as 13.9%. Wołf (1982) reported that the percentage of culling due to disorders of the locomotor organs of dairy cows
was 4.3%.

Materials and Methods

The present task was carried out as a comparative experiment with three groups of dams: Bohemian Pied cattle (C) n=46, Bohemian Pied X Red Holstein crosses with a 50% proportion of blood (CR) n=62 and Bohemian Pied X Ayrshire cattle with a blood proportion ranging from 25 to 53.25% (CA) n=65. In order to ensure identical environmental conditions, these breeding groups were concentrated on one farm. The high-pregnant heifers were housed in the barn for primiparae and in the 2nd and 3rd lactations they were transferred to a large-scale cow-shed with short stanchions and grated dunging pit. Investigations were carried out under normal conditions of management of the School Agricultural Enterprise of the University of Veterinary Science in Nový Jičín; this enterprise had been selected for tests of the genetic pool of foreign breeds of dairy cows to be crossed with the Bohemian Pied cattle.

An overall survey of culling and its causes were continuously followed from veterinary documentation, primary zootechnical records and entries of the performance control separately for the first, second and third lactation. The differences of the individual breeding groups were calculated from these data and expressed in per cent.

Results

Tab. 1 gives the number of culled animals within the breeding groups compared in the individual time periods since birth till the 3rd lactation. It can be seen that in the 1st lactation 37.00% of cows included in the experiment in group C were culled; in the CA and CR crosses the percentage was by 10.58 and 22.95% lower, respectively, than in group C. In the 2nd lactation it was 11.00% in group C; in CR and CA crosses it was by 1.08 and 3.45% lower, respectively, than in group C. In the 3rd lactation it was 19.00% of dairy cows; in the CA and CR crosses it was by 4.14 and 4.58% higher.

Tab. 2 gives the causes of culling within the individual breeding groups according to the sequence of lactations. The division of causes of culling of the experimental dairy cows given in per cent shows the differences among the groups in the individual lactations. In the 1st lactation, the highest percentage of culling due to low efficiency was found in the CR crosses (i.e. 41.18%), in the 2nd lactation the percentage of culled cows was the highest in group C (i.e. 27.27%) and in the 3rd lactation in the CA crosses (i.e. 60.00%). In the 1st lactation culling due to disorders in reproduction was the highest in the CR crosses (i.e. 35.29%), in the 2nd lactation in the CR and CA crosses (i.e. 50.00%) and in the 3rd lactation in the CA crosses (i.e. 20.00%). Diseases, functional disorders and morphological changes of the milk gland were the causes of culling of the CR crosses in the 1st lactation and the 3rd lactation (i.e. 17.65 and 25.00%, respectively). In the 2nd lactation, 18.18% of dams were culled in group C due to the same causes. As compared with the other groups, the post-parturition complications as a cause of culling were the lowest in CR crosses in all lactations. More post-parturition complications occurred in the 2nd lactation in dams of group C (i.e. 27.27%) and in the CA crosses (i.e. 25.00%). Other disorders of the sexual organs were recorded in the 1st lactation only in groups C and CA. The occurrence of diseases of the locomotor organs was marked in the 2nd lactation in CR crosses (i.e. 33.33%) while in the 3rd lactation it was only
Table 1
Total culling of the investigated breeding groups from birth till the 3rd lactation

<table>
<thead>
<tr>
<th></th>
<th>CR group n = 120</th>
<th></th>
<th>C group n = 100</th>
<th></th>
<th>CA group n = 106</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>up to 6 months of age</td>
<td>20 head</td>
<td>16.53%</td>
<td>up to 6 months of age</td>
<td>16 head</td>
</tr>
<tr>
<td></td>
<td>up to 21 months of age</td>
<td>14 head</td>
<td>11.57%</td>
<td>up to 21 months of age</td>
<td>4 head</td>
</tr>
<tr>
<td></td>
<td>up to the 1st lactation</td>
<td>17 head</td>
<td>14.05%</td>
<td>up to the 1st lactation</td>
<td>37 head</td>
</tr>
<tr>
<td></td>
<td>up to the 2nd lactation</td>
<td>12 head</td>
<td>9.92%</td>
<td>up to the 2nd lactation</td>
<td>11 head</td>
</tr>
<tr>
<td></td>
<td>up to the 3rd lactation</td>
<td>28 head</td>
<td>23.14%</td>
<td>up to the 3rd lactation</td>
<td>19 head</td>
</tr>
<tr>
<td></td>
<td>living</td>
<td>30 head</td>
<td>24.79%</td>
<td>living</td>
<td>13 head</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>up to 6 months of age</td>
<td>6 head</td>
<td>5.66%</td>
<td>up to 6 months of age</td>
<td>16 head</td>
</tr>
<tr>
<td></td>
<td>up to 21 months of age</td>
<td>14 head</td>
<td>13.21%</td>
<td>up to 21 months of age</td>
<td>14 head</td>
</tr>
<tr>
<td></td>
<td>up to the 1st lactation</td>
<td>28 head</td>
<td>26.42%</td>
<td>up to the 1st lactation</td>
<td>28 head</td>
</tr>
<tr>
<td></td>
<td>up to the 2nd lactation</td>
<td>8 head</td>
<td>7.55%</td>
<td>up to the 2nd lactation</td>
<td>8 head</td>
</tr>
<tr>
<td></td>
<td>up to the 3rd lactation</td>
<td>25 head</td>
<td>23.58%</td>
<td>up to the 3rd lactation</td>
<td>25 head</td>
</tr>
<tr>
<td></td>
<td>living</td>
<td>25 head</td>
<td>23.58%</td>
<td>living</td>
<td>13 head</td>
</tr>
</tbody>
</table>

3.57%. Due to orthopedic disorders, 10.53 and 8.00% of cows of group C and CA crosses, respectively, were culled in the 3rd lactation. Attention should be paid to the highest percentage of culling (i.e. 14.2%) due to traumatic diseases of the digestive system in the 3rd lactation in the CR crosses. The percentage of culling due to acute diseases and emergency slaughter was the highest (i.e. 8.11%) in the 1st lactation in group C.

Discussion

The total percentage of culling in the groups investigated in the present study in the 1st and 2nd lactations corresponds with the results of Suchánek et al. (1972), Suchánek and Ulrych (1975), Suchánek and Golda (1983) and Suchánek (1982). Contrary to the data given by the above authors, in our present study culling was by 4.14 and 4.58% higher in the CA and CR crosses, respectively, in the 3rd lactation than in group C.

Culling due to low efficiency as given by various authors reached 15% (Renkema and Stelwagen 1979), 11.9% (Kirst 1979), 33.54% (Slipka and Hajíč 1981), 38.7% (Wolf 1982). According to Vácha 1 (1983) culling in the CR crosses was by 2.8 to 13.2% lower in the CR crosses than in their herd mates of group C. In our present observations we found that the percentage of culling was the lowest.
Table 2
Causes of culling within the individual breeding groups according to the sequence of lactations in per cent

<table>
<thead>
<tr>
<th>Causes of culling</th>
<th>1st lactation</th>
<th>2nd lactation</th>
<th>3rd lactation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CR</td>
<td>C</td>
<td>CA</td>
</tr>
<tr>
<td>low efficiency</td>
<td>41.18</td>
<td>37.84</td>
<td>28.57</td>
</tr>
<tr>
<td>disorders of reproduction</td>
<td>35.29</td>
<td>21.62</td>
<td>32.14</td>
</tr>
<tr>
<td>diseases, functional disorders and morphological changes of the mammary gland</td>
<td>17.65</td>
<td>8.11</td>
<td>14.28</td>
</tr>
<tr>
<td>post-parturition complications</td>
<td>5.88</td>
<td>13.51</td>
<td>14.28</td>
</tr>
<tr>
<td>other diseases of the sexual organs</td>
<td>0</td>
<td>5.40</td>
<td>7.14</td>
</tr>
<tr>
<td>diseases of the locomotor organs</td>
<td>0</td>
<td>2.70</td>
<td>0</td>
</tr>
<tr>
<td>traumatic diseases of the digestive system</td>
<td>0</td>
<td>2.70</td>
<td>0</td>
</tr>
<tr>
<td>other acute diseases, including emergency slaughter</td>
<td>0</td>
<td>8.11</td>
<td>3.57</td>
</tr>
</tbody>
</table>

in the 1st lactation in the CR crosses; there was a marked decrease in the CR crosses in the 2nd lactation. The percentage of culling was nearly the same in group C and the CA crosses. Very interesting is the finding that more than 50.00% of all the groups investigated were culled in the 3rd lactation due to low efficiency. The percentage of culling of our crosses is in accordance with data given by other authors only as concerns the differences between the 1st and the 2nd lactation. While other authors reported that with continuing lactations the percentage of culling in the crosses continuously decreased, in our breeding groups the percentage of culling was found to be the highest in the 3rd lactation.

Many authors dealt with problems connected with culling due to disorders in reproduction. The values given were 10.2% (Kirst 1979), 25% (Renkema and Stelwagen 1979), 27.34% (Slipka and Hajic 1981), 15.5% (Wolf 1982), 29.3 - 30.9% (Lotthammer 1984) and 25% (Kadecka 1985). According to Váchal (1983), the percentage of culling of the CR crosses in the 1st lactation due to health disorders reached 7.6 - 11.7%. The percentage found in the present study in all the three breeding groups was nearly twice as high as the data of Váchal (1983). In the 2nd lactation, culling of the CR and CA crosses considerably increased due to disorders in reproduction, only the data of group C are in accordance with data of Slipka and Hajic (1981). The percentage of culling in the 3rd lactation in the CR crosses due
to disorders in reproduction was relatively low, i.e. 3.57%. The lower
countage of culling in the 3rd lactation in all the groups compared can be
explained by a stricter selection for reproduction reasons in the 1st and
especially in the 2nd lactation.

Due to disorders of the milk gland, R en k e ma and S t e l-
wa gen (1979), K i r s t (1979), S l i p k a and H a ji č (1981)
and W o l f (1982) give the values of 20.00, 7.1, 8.45 and 12.5%,
respectively. The percentage of culling due to disorders of the milk gland
in the groups investigated is virtually in accordance with data of these
authors, only in the CR crosses in the 3rd lactation the percentage of culling
was found to be the highest, i.e. 25.00%, what can be explained by a higher
reaction and sensitivity of the CR crosses to the conditions of breeding and
by their higher milk production.

Post-parturition complications were the lowest in the CR crosses in all
the three lactations, whereas culling was the highest in group C and in the
CR crosses in the 2nd lactation.

According to K r á l et al. (1977), G r e e n o u g h et al. (1981)
and W o l f (1982), culling due to disorders of the locomotor organs
reached 10 - 20 or more, 1.5 - 40 and 4.38%, respectively. The percentage of culling in the groups investigated in the present study are virtually the same
as data of these authors, only in the 2nd lactation this percentage increased
to 33.33% in the CR crosses what can be explained by their higher sensitivity
and bigger body framework as compared with the CA crosses and dams of
group C and due to the transfer of dairy cows on the 2nd lactation to the
large-scale cow-shed with short stanchions and grated dunging pit. This high
percentage of culling in the 2nd lactation was very favourably reflected in the 3rd
lactation when culling due to orthopedic disorders in the CR crosses
decreased to 3.57%.

On the basis of analysis of the causes of culling it is necessary to carry
out the required measures in nutrition, in the field of prevention, management,
and zoohygiene.

Příčiny vyřazování českého strakatého skotu a kříženek s červeným
holštýnským a ayrshirským plemem

V rámci celkového vyřazování sledovaných plemenných skupin do III. laktace bylo nejnižší procento vyřazování zjištěno u kříženek CR (českého straka-
tého s červeným holštýnským), pokud větší u kříženek CA (českého straka-
tého s ayrshirským), zatímco nejvyššího vyřazování dosáhla skupina C (český
strakatý skot). U obou skupin kříženek CR a CA bylo vyřazování podstatně
nižší ve srovnání s plemenicemi C, což lze přičist heteroznímu efektu u kříže-
nek.

Z příčin vyřazování dojnic jednotlivých plemenných skupin dle pořadí
laktace bylo pro nízkou užitkovost vyřazeno nejvíce dojnic v rámci všech ple-
mnenných skupin na III. laktaci, přičemž kříženky CR (53,57%) měly toto vy-
řazování nižší než kříženky CA (60,00%) a skupina C (57,89%). Pro poruchy
reprodukce bylo na III. laktaci vyřazení podstatně menší, z toho opět křížen-
ky CR měly vyřazení nejnižší (3,57%). Naopak kříženky CR dosáhly nejvyš-
šího vyřazování na III. laktaci z důvodů onemocnění, funkčních poruch a
morfoloˇtických změn mléčné žlázy (25,00%). U kříženek CR bylo nejvyšší
procento vyřazení pro onemocnění pohybového aparátu zaznamenáno na II. laktaci (33,33%), kdy byly převedeny do stáje s krátkým stáním se zaroštova-
ným kalištem.
Причины выбраковки чешской пестрой породы и помесей с красной гольштейнской и айширской породами

В рамках общей выбраковки исследуемых племенных групп до Ш лактации самый низкий процент выбраковки был установлен у помесей CR (чешская пестрая с красной гольштейнской породой), незначительно больше у помесей CA (чешская пестрая порода с айширской породой), между тем как самая большая выбраковка встречалась у группы C (чешская пестрая порода). У обеих групп помесей CR и CA выбраковка была существенно ниже по сравнению с племенными матками С, что можно связать с гетерогенным эффектом помесей.

Из причин выбраковки дойных коров отдельных племенных групп по порядку лактации из-за низкой продуктивности было самое большое количество дойных коров в рамках всех племенных групп отобраны на стадии В лактации, при этом помесь CR (53,57%) отличалась по сравнению с помесями CA (60,00%) и группой С (57,89%) меньшей выбраковкой. Из-за нарушений репродукции на стадии III лактации выбраковка была существенно ниже, у помесей CR была оплат-таки самая низкая (3,57%). Наоборот, помесь CR достигла самой высокой выбраковки во время III лактации по причинам заболевания, функциональных нарушений и морфологических изменений молочной железы (25,00%). У помесей CR причина самого большого процента выбраковки сводилась к заболеваниям двигательного аппарата на П лактации (33,33%), когда коровы были переведены в коровник с коротким стойлом и решеткой покрытым отвальным каналом.

References