RESEARCHES REGARDING THE INFLUENCE OF DAYS OPEN AND DAYS DRY ON THE MILK PRODUCTION IN FIRST CALVING ROMANIAN SPOTTED COWS

CERCETĂRI PRIVIND INFLUENŢA DURATEI REPAUSULUI UTERIN ŞI A REPAUSULUI MAMAR ASUPRA PRODUCŢIEI DE LAPTE LA VACILE PRIMIPARE DIN RASA BĂLŢATĂ ROMÂNEASCĂ

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The purpose of the paper was to study the influence of the length of days open and days dry on the milk yield, as well as to establish correction coefficients to standardize the lactations of the Romanian Spotted primiparous cows according to these factors. Researches were carried out on 667 lactations from Romanian Spotted primiparous cows. Lactations were assigned to one of the eight classes of days open: 20-40, 41-60, 61-80, 81-100, 101-120, 121-140, 141-160, and over 160 days. For days dry seven classes were formed: 0-20, 21-40, 41-60, 61-80, 81-100, 101-120, and over 120 days. The highest current production was obtained when cows were open between 101 and 120 days (3476.1 kg milk). Correction coefficients were higher for shorter days open, starting with 1.14 when days open were between 20 and 40 days, and they were lower for days open length close to 101-120 days interval (1.01 for 121-140 days open). Milk yield per normal lactation increased from 2960.4 kg when previous days dry was low (0-20 days dry) to the highest production of 3919.2 kg for days dry interval between 61 and 80 days. The standardization coefficients for days dry were higher for lower classes, starting with 1.32 in 0-20 days dry class and decreasing down to 1.04 for the class of 81-100 days dry. Both for days open and days dry, the milk yield was lower when these periods were shorter than in the case these periods were longer, suggesting that milk production data should be adjusted at least for short periods of these reproduction indices.

Key words: days open, days dry, milk yield, Romanian Spotted, primiparous cows.

Introduction

Milk production per cow has increased as a result of progressive changes that have occurred in the genetics and management of the dairy animal population. A
Management constant throughout the decades has been the widely recommended and adopted dry period length of 51 to 60 days. Early 1900’s textbooks recommended dry period ranging from 4 to 10 weeks in length. The practice of drying cows as they approach parturition has been developed from the experience of practical farmers and dairymen over more than a century, rather than based on the results of planned experiments. Several authors have established the empirical relationship between days dry and subsequent milk production on observational (non-experimental) data. They found that increasing the length of dry period increased the milk production by a diminishing return.

Reproductive performance is an important supportive trait in the efficiency of lifetime milk yield. Days open from parturition to the subsequent conception affects milk yield of cows. With fewer current days open, nutrients consumed during late lactation are partitioned to gestational needs rather than to yield, and often cows are dried off prior 305 days in milk. With more days open, cows have more time to renew the body fat that is used for yield during the next lactation, and the converse may be expected. High milk yield appears to be antagonistic to early conception because high yielding cows may not conceive as readily as low yielding cows, and cows with more days open may have less interference from pregnancy on lactational milk yield.

The purpose of the present paper was to study the influence of the length of days open and days dry on the milk yield, as well as to establish correction coefficients to standardize the lactations of the Romanian Spotted primiparous cows according to these factors.

Materials and Methods

Researches were carried out on 667 lactations from Romanian Spotted primiparous cows. Data was obtained from the County Unit for Reproduction and Selection Timiș. Those lactations were introduced in the database that had the minimum length of 270 days. The milk yield per normal lactation was corrected for mature equivalent using the official standardization coefficients for parity and age at first calving.

Lactations were assigned to one of the eight classes of days open length, as follows: 20-40, 41-60, 61-80, 81-100, 101-120, 121-140, 141-160, and over 160 days.

For days dry 7 classes of length were formed, as follows: 0-20, 21-40, 41-60, 61-80, 81-100, 101-120, and over 120 days. Lactations were assigned to classes and dispersion indices were calculated.
Both for days open and days dry the relative value of the milk yield for each class in respect with the class having the maximum yield was calculated. From this the standardization coefficients were calculated for each class.

Results and Discussions

Influence of days open on the current milk yield is presented in Table 1. The milk yield of Romanian Spotted primiparous cows was below the genetic potential. The highest current production was obtained when cows were open between 101 and 120 days (3476.1 kg milk). As days open length was reduced the milk yield decreased down to 3040.2 kg for 20 to 40 days open. Also, when the number of days cows were open increased above 120 days the milk yield showed a reduction to 3353.2 kg, when cows were open more than 160 days.

Dispersion indices for milk production were within normal ranges, variability coefficient varying from 26.3% to 29.5%.

When cows stayed open for a very short period after calving the milk yield was 87.4% from the production when days open were between 101 and 120 days. After this interval, the reduction in milk yield was very low, up to 3.5% when there were over 160 days open.

Correction coefficients were higher for shorter days open, starting with 1.14 when days open were between 20 and 40 days, and they were lower for days open length close to 101-120 days interval (1.01 for the days open interval of 121-140).

Data in Table 1 shows that as current days open increase the milk yield increase as well. After reaching the maximum production at 101-120 days open length the milk yield stared to decrease, but the reduction is very low. The practical application of our findings is that milk production data should be adjusted at least for short current days open (<100 days). Similar results were found by other researchers [1, 4, 5, 9, 12].

Selection against cows with short days open selects against good fertility.

<table>
<thead>
<tr>
<th>Days open class</th>
<th>n</th>
<th>X±SEM</th>
<th>SD</th>
<th>vc (%)</th>
<th>% from maximum lactation</th>
<th>Correction factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-40</td>
<td>29</td>
<td>3040.2±148.8</td>
<td>801.2</td>
<td>26.4</td>
<td>87.4</td>
<td>1.14</td>
</tr>
<tr>
<td>41-60</td>
<td>57</td>
<td>3216.4±124.5</td>
<td>940.3</td>
<td>29.2</td>
<td>92.5</td>
<td>1.08</td>
</tr>
<tr>
<td>61-80</td>
<td>86</td>
<td>3325.2±105.8</td>
<td>981.4</td>
<td>29.5</td>
<td>95.7</td>
<td>1.05</td>
</tr>
</tbody>
</table>

Table 1

Averages and dispersion indices for milk yield per normal lactation (kg), and correction factors for milk yield standardization according to days open length.
Results of days dry length on milk production of subsequent lactation are presented in Table 2. Milk yield per normal lactation increased from 2960.4 kg when previous days dry was low (0-20 days dry) to the highest production of 3919.2 kg for days dry interval between 61-80 days. This later class comprised, also, the most number of lactations (n=277).

When cows were given shorter dry periods the milk production was only 75.5% compared to the optimum length of 61 to 80 days dry.

The standardization coefficients for days dry were higher for lower classes, starting with 1.32 in 0-20 days dry class and decreasing down to 1.04 for the class of 81-100 days dry.

Reduction in days dry resulted in lower milk yields by 5 to 30%. Increased length of days dry has a lower influence on the milk yield, but is economically inefficient.

Other authors found similar results, that the optimum length of days dry should be around 60 days [2, 3, 6, 7, 8, 10, 11].

Table 2

<table>
<thead>
<tr>
<th>Days dry class</th>
<th>n</th>
<th>X±SEM</th>
<th>SD</th>
<th>vc (%)</th>
<th>% from maximum lactation</th>
<th>Correction factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-20</td>
<td>17</td>
<td>2960.4±119.0</td>
<td>490.5</td>
<td>16.5</td>
<td>75.5</td>
<td>1.32</td>
</tr>
<tr>
<td>21-40</td>
<td>48</td>
<td>3397.5±148.7</td>
<td>1030.7</td>
<td>30.3</td>
<td>86.6</td>
<td>1.15</td>
</tr>
<tr>
<td>41-60</td>
<td>114</td>
<td>3696.2±81.5</td>
<td>870.2</td>
<td>23.5</td>
<td>94.3</td>
<td>1.06</td>
</tr>
<tr>
<td>61-80</td>
<td>277</td>
<td>3919.2±55.0</td>
<td>915.6</td>
<td>23.4</td>
<td>100.0</td>
<td>1.00</td>
</tr>
<tr>
<td>81-100</td>
<td>95</td>
<td>3758.2±92.4</td>
<td>900.3</td>
<td>23.9</td>
<td>95.9</td>
<td>1.04</td>
</tr>
<tr>
<td>101-120</td>
<td>45</td>
<td>3727.0±131.2</td>
<td>880.4</td>
<td>23.6</td>
<td>95.1</td>
<td>1.05</td>
</tr>
<tr>
<td>Over 120</td>
<td>71</td>
<td>3692.5±105.7</td>
<td>890.6</td>
<td>24.1</td>
<td>94.2</td>
<td>1.06</td>
</tr>
</tbody>
</table>

Kuhn et al., 2006 found out that when adjusted for milk yield, short dry periods resulted in poorer fertility in the subsequent lactation. Long days dry
improved somatic cell score in the subsequent lactation, thus farms with mastitis problems should be cautious in shortening days dry.

Conclusions

The highest milk yield was produced by cows having between 101 and 120 days open, thus we consider this class as being the optimum length of days open in the Romanian Spotted primiparous cows.

The class interval of 61 to 80 days dry has produced the highest milk yield per normal lactation.

Both for days open and days dry, the milk yield was lower when these periods were shorter than in the case these periods were longer.

Standardization coefficients for days open and days dry were calculated for Romanian Spotted breed cows.

Further investigations are needed to determine the optimal length of days open and days dry for modern dairy cows in differing management scenarios.

Bibliography


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Scopul prezentei lucrări a fost acela de a studia influenţa duratei repausului uterin şi a repausului mamar asupra producţiei de lapte, precum şi de stabili coeficienţi de corecţie pentru standardizarea lactaţiilor pentru aceşti doi indici la vacile primipare din rasa Bâlţată românească. Cercetările s-au efectuat pe un număr de 667 lactaţii de la vacile primipare din rasa Bâlţată românească. Lactaţiile au fost împărţite în opt clase în funcţie de durata repausului uterin astfel: 20-40, 41-60, 61-80, 81-100, 101-120, 121-140, 141-160 şi peste 160 de zile. Pentru durata repausului mamar s-au format şapte clase, astfel: 0-20, 21-40, 41-60, 61-80, 81-100, 101-120 şi peste 120 de zile. Cea mai mare producţie de lapte s-a obţinut în cazul în care vacile au avut o durată a repausului uterin cuprinsă între 101 şi 120 de zile (3476,1 kg lapte). Coeficienţi de corecţie au fost mai mari atunci când durata repausului uterin a fost mai mică, pornind de la 1,14 la clasa de repaus uterin de 20-40 zile, şi au avut valori mai mici atunci durata repausului uterin a fost apropiat de 101-120 zile (1,01 pentru clasa 121-140 zile repaus uterin). Producţia de lapte pe lactaţie normală a crescut de la 2960,4 kg atunci când durata repausului mamar anterior a fost mică (0-20 zile) şi a fost maximă, de 3919,2 kg, atunci când durata repausului mamar s-a încadrat în intervalul 61-80 zile. Coeficienţi de standardizare pentru repausul mamar au fost mai mari pentru clasele mai mici de 61 de zile, începând cu valoarea de 1,32 pentru clasa 0-20 de zile, şi s-au redus până la valoarea de 1,04 pentru clasa 81-100 zile de repaus mamar. Atât pentru repausul uterin cât şi pentru mamar, producţia de lapte a fost mai mică atunci când durata acestor perioade a fost mai scurtă decât atunci când durata a fost mai lungă. Acest lucru sugerează că producţia de lapte trebuie ajustată cel puţin pentru durata mai scurtă a acestor indici de reproducţie.

Cuvinte cheie: repaus uterin, repaus mamar, producţia de lapte, Bâlţată românească, vaci primipare.