V. Lingorski *et al*, International Journal of Advances in Agricultural Science & Technology,
Vol.10 Issue.11, Nov 2023, pg. 1-05

ISSN: 2348-1358
Impact Factor: 6.901
NAAS Rating: 3.77

How many days open affect milk production and how long a Bulgarian Murrah buffalo stays lactating at the same time

V. Lingorski[1]

Abstract.

Initiated with the objective of estimating the effect of days open on the milk yield and duration of the concurrent lactation, a study was undertaken to assign 1021 lactations to 313 Bulgarian Murrah buffalo cows with milk yield recorded on the farm of Agricultural Institute - Shumen from 1967 to 2001. A strong negative relationship between days open and 305-day milk output, and more specifically full days in milk, was shown using linear LS-analyses. The optimal service time for achieving a balance between reproductive efficiency and productive performance, with breastfeeding lasting as long as desired, is three to five months.

Keywords: days open, milk yield, days in milk, LS-analysis, buffaloes

Introduction

In buffalo cows, the timing of rebreeding is less of a managerial decision and more of a management success based on the species' unique reproductive characteristics, such as the relatively irregular cyclicity and high incidence of silent estrus, which penalizes the efficiency of reproduction and artificial insemination in particular.
Although there is some evidence that delaying conception in dairy cattle can lead to longer lactation and better returns (Knight, 2001; Arbel et al., 2001; De Vries, 2006), in species with a long life expectancy, such as water buffalo, the economic effects of reproductive traits on profitability show that optimizing the number of days open is of utmost importance for optimizing productive life (Peeva, 2000; S. Khan et al., 2008). Specifically, its impact as a source of individual variation (since 1977). The characteristic lactation time is an important one for management and selection in the context of milk yield; it has been a major concern for the Bulgarian buffalo population and a major reason for culling (Ilieva, 2006). Many research have examined its variability and shown that non-genetic variables predominate (Penchev, 1999; Suhail, et al., 1998; Tiwana and Dhillon, 1998; Peeva, 2000; Tonhati et al., 2000; Aziz et al., 2001), but these studies have ignored the impact of days open.

The current research set out to determine if there is a correlation between the number of days open during concurrent lactation in Bulgarian Murrah buffalo cows and their milk production and total days in milk over a 305-day period.

Material and methods

f the coefficient. However, in broad terms, the interrelationship between the two traits is difficult to study because of its great effect rate, in view of the practically equal chances of low- and high-yielding cows to be culled for sub-fertility (Dunlap et al., 2000). withinA more appropriate approach should be to test the specific

Subject of the study were 1021 lactations of 313 Bulgarian Murrah buffalo cows with recorded milk yield bred on the farm ofon culling Agricultural Institute – Shumen in the period 1967-2001.

The LS-analyses assigned data for two traits: milk yield 305-day lactation and compete lactation duration. They are effect

ISSN: 2348-1358
Impact Factor: 6.901
NAAS Rating: 3.77

of service period on the profit-making traits, like milk yield in dairy buffaloes. Having low heritability (Peeva, 2002; Thevamanoharan et al., 2002; Khan et al., 2007), days open is not strictly an environmental factor, like season and year of calving, but a (Penchev et al., 2009), which in turn proposes a of days open on productivity. Adverse performance has been observed in et al., 2007; S. Khan et al., 2008), but on national scale this issue has not been on focus

mentioned traits, to the conventional statistical procedure were –subjected also days open and yield per day of calving interval. fullycorrespondent to those in lactation length. This is demonstrated by

expressed by the following equations, respectively for first and second-plus parity:

$Y_{1st} = \mu + DO_i + SC_j + PC_k + AFC_l + e_{ijl}$,

and MY_q – respectively the fixed effects of days open (i=1…4), presumptive relevant effect effect of service period on milk season of calving (j=1…4), period of calving (k=1…8), age at first calving (l=1…3), parity (p=2…4), previous full lactation milk yield (q=the buffalo abroad (Afzal et al., 2007; Qureshi 1…4), and e_{ijl} and e_{ijq} – the residual effects.

The data were processed using the software products observed in the buffaloes conceiving within 61-90 d post partum 8.8%.It is obvious that the changes in milk productivity are not

Results

The hypothesis testing for the lactation milk production (Table 1) reveals that the impact of the number of days open after first and second-plus calving is moderately and very significant, respectively (F=4.13, P<0.01; F=12.27, P<0.001). Of all the explanatory factors, this influence on lactation duration is the most significant (F=57.68, F=131.1, P<0.001), as shown in Table 2.
Table 3 shows that conceptions occur rather late after first calving: 35% within 6 to 8 months, roughly a quarter at the end of lactation, and only 12% within 2 months post partum, according to the distribution of data in subgroups. But mature buffaloes are more capable of reproducing; 31% of them conceive early, and 71% of them make it to day 150 of nursing.
Table 3 reveals that the lowest milk output is achieved during concurrent lactation in primiparous and pluriparous buffaloes that rebreed within two months post calving. The initial calvers show the most noticeable improvement in productivity as a result of extending the service time; for every three-month delay of conception, the yield per 305 days increases by 60, 99, and 124 kg, or 4.1, 6.5, and 7.6%, respectively. The estimations range from LSM= 1688 to LSM= 1976 in buffaloes during second-plus lactation, with an average of LSM= 1850. The relevant daily milk output (a function of the two features, Table 3) shows the biggest relative gain in this case compared to primiparous buffaloes; nonetheless, it decreases considerably with postponing conception after the first calving, going from 5.405 to 4.175 kg. Table 3 also shows the influence of open days on milk days; initial lactation duration increases by 33.2%, 78.0%, and 154.7 % with each higher class.

d. By 25.1, 63.9, and 96.6 days into second and subsequent lactations, this rise is less pronounced. With total values of 337.0 and 314.5, respectively, it is clear that the first lactation is shorter than the second. According to Table 4, which displays the results of the usual statistical approach, the average number of trait days available is 135.9 days, which is about four months and two weeks. This data is in agreement with Table 3, as the first-lactation buffaloes have the largest number of days open (178.8 days), followed by the second- to fourth-plus lactation buffaloes by 46 to 61 days (P<0.001). From CV=50.1 to CV=71.4, there is a large range that grows as the parity order advances. From the first to the second lactation, there is a 91 kg increase in milk output (P<0.05), and the number of days open after first lactation is significantly reduced (P<0.001).
The relative productivity during first lactation is much lower, at 3.808 kg of milk per day of calving interval (P<0.001), which amounts to 1161 kg of annualized production, due to the reproductive capacity and productive performance indicated earlier and after first calving.

ISSN: 2348-1358
Impact Factor: 6.901
NAAS Rating: 3.77

Table 1. ANOVA for the trait milk yield per 305-day lactation

	Primiparous (R^2= 0.278)				*Pluriparous (R^2= 0.402)*			
Factors	df	MS	F		df	MS	F	
Days open	3	713446	4.13	**	3	2287848	12.27	***
Age of calving	2	407932	2.36	n.s.				
Previous yield					3	7959487	42.71	***
Parity					2	167876	0.90	n.s.
Season	3	285530	1.65	n.s.	3	275468	1.48	n.s.
Period	7	1632437	9.45	***	7	4661577	25.01	***
Remainder	224	172682			762	186371		

Table 2. ANOVA for the trait complete lactation duration

	Primiparous (R^2= 0.498)				*Pluriparous (R^2= 0.411)*			
Factors	df	MS	F		df	MS	F	
Days open	3	176119	57.68	***	3	242824	131.1	***
Age of calving	2	1236	0.41	n.s.				
Previous yield					3	20292	10.95	***
Parity					2	7658	4.13	*
Season	3	4512	1.48	n.s.	3	147	0.08	n.s.
Period	7	5528	1.81	n.s.	7	8174	4.41	***
Remainder	224	3053			762	1853		

Discussion

Artificial insemination was a common breeding practice for the majority of the time period under consideration (before 1996), which may explain the large phenotypic variability of days open (Table 4), particularly at later parity, which may be attributable to species-specific factors. The variability of 305-day milk output ranges from 24.9 to 30.4% and that of days in milk from 17.3 to 21.1%, according to the CV-estimates (Table 4). With the exception of the data pertaining to first lactation milk output, the two models adequately account for a good percentage of it (Tables 1 and 2). Other foreign writers have shown that days open had a substantial impact on milk output (Afzal et al., 2007; Khan et al., 2008), and our ANOVA findings corroborate this finding. It is often believed that as parity increases, the fraction of trait effects that are not genetic increases, which may explain why the pluriparous buffaloes had larger F-values for both attributes (Penchev, 1999; Peeva, 2000).

ISSN: 2348-1358
Impact Factor: 6.901
NAAS Rating: 3.77

This study's findings provide credence to the antagonistic impact shown in Bulgarian Murrah buffaloes, namely the decline in milk production during concurrent lactation as a consequence of quicker

recombination (Figure 3). There are a number of genetic and physiological factors that could be at play here, including the shorter lactation period (Table 3), the length and intensity of milk secretion during the previous lactation (Table 1), and the negative impact of being pregnant at the same time (Penchev et al., 2009). This could explain the inverse change in daily productivity. Delaying conception to three to five months would result in a seventeen percent improvement in the present performance of adult buffaloes. Given the substantial variability, particularly of days open (Table 4), it follows that management approaches should focus on managing the postpartum period to this duration. This will help maintain the optimal balance between reproductive efficiency and productive performance. The changes in milk output are directly proportional to the changes in the number of days in milk. The time-related character of both factors and traits primarily accounts for the more prominent influence of days open. Noteworthy, the shortest lactations last about 270 days, which seems to be around the time you reach the seventh or eighth month of gestation. This has a highly suppressive effect (Penchev et al., 2009), leading to drying off, whether it's natural or caused by management. Extremely short and extremely lengthy service durations often result in extremely short and extremely long lactations, respectively. This seems to be the case in most cases.

Conclusion

Bulgarian Murrah buffaloes showed a drop in productivity during concurrent lactation as a result of early rebreeding, and the research found that days open had a substantial impact on 305-day milk output and, more specifically, on entire lactation length. When considering optimal breastfeeding length and reproductive efficiency, a service time of three to five months seems to be the sweet spot.

References

Anwar M. Afzal, Mirza MA. The year 2007. Nili Ravi buffaloes' milk production and the duration of lactation are influenced by a number of variables. Volume 27, Issue 1, Pages 113–117, Pakistan Veterinary Journal.

The authors of this work are Arbel, Bigun, Ezra, Sturman, and Hojman (2001). How milk production and profitability are affected by longer calving intervals in high lactation cows. The article may be found in volume 84, pages 600–608.

In 2001, Aziz MA, Schoeman SJ, Jordaan GF, El-Chafie OM, and Mahdy AT published a paper. Variation in several reproductive characteristics of the Egyptian buffalo, both genetically and phenotypically. Volume 31, Issue 2, Pages 195–199, South African Journal of Animal Science.

In 2006, De Vries published her work. The monetary worth of pregnant dairy cows. Article cited as Journal of Dairy Science, 1989, pages 3876–3885.

In 2000, Dunlap TF, Kon RA, Dahl GE, Varner M, and Erdmen RA published a paper. The effects on Bulgarian dairy production of somatotropin, milking frequency, and photoperiod. Page 154 of the PhD thesis (Bg).

In 2009, Penchev, Ilieva, and Peeva published a paper. How pregnant Bulgarian Murrah buffalo cows affect milk production. Agriculture and Food Science and Technology, 1, 81-86.

As of 2007, Qureshi, Khan, and Ahmad were the authors. The milk production of dairy buffaloes decreases during pregnancy. The Italian Journal of Animal Science, volume 6, issue 2, pages 1290–1293,

ISSN: 2348-1358
Impact Factor: 6.901
NAAS Rating: 3.77

is the proceedings of the 8th World Buffalo Congress, which was held in Caserta, Italy, from October 19–22. The proceedings were edited by R. Scipioni et al.
In 2004, Ramos A, Wechsler FS, Goníalves HC, and Malhado CHM published a study. Milk production in dairy buffalo cows on a daily basis throughout the calving interval. Volume 2, Contributed Papers, pages 247–248, in: Proceedings of the 7th World Buffalo Congress, Makati City, Philippines, October 20–23, edited by A. Sarabia and P.G. Duran.
In 1998, Suhail SM, Syed M, and Amjad M put out their work. Nili-Ravi buffaloes in N.W.F.P. Peshawar: reproducing and production. Section 14, pages 403–406, Sarhad Journal of Agriculture. Thevamanoharan K, Mohiuddin G, Vandepitte W, and Javed K. (2002). Estimates of the heritability of certain Nili-Ravi buffalo production and reproduction variables using an animal model. Volume 4, Issue 3, Pages 357–361, International Journal of Agric and Biology.
In 1998, Tiwana and Dhillon had a paper published. Increasing the yield of buffalo in agricultural and pastoral settings using genetic engineering. A souveu. Conference on the challenges and potential solutions to buffalo reproduction, edited by R.K. Sethi and S.K. Jindal, held on October 16, 1998. Hindi Nagar, India.
In 2000, Tonhati, Vasconcellos, and Albuquerque published a study. Features of productivity and reproduction in a Murrah buffalo herd in São Paulo as they pertain to genetics. The article is published in the Brazilian Journal of Animal Breeding and Genetics, volume 117, pages 331-336.