RESEARCH NOTE

MORNING AND EVENING MILK YIELD OF IMPORTED GERMAN HOLSTEIN CATTLE IN A HOT HUMID TROPICAL ENVIRONMENT

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(Received 28 June, 1990; accepted 31 October, 1990).

Twice-day milking is a common management practice on many farms but the interval before a.m. milking is usually longer than preceding p.m. milking. Previous reports indicate that a.m. milk yields outweighs p.m. yield and constitutes 55.8-59.8% of the total daily milk yield especially when a 15-hour interval precedes a.m. milking. The difference between a.m. and p.m. milk yields ranges between 1.2 and 1.5 kg among low yielders compared with 7.6 kg among high yielders that produced 33.6 kg/day in peak lactation. It is also influenced by the state of lactation and the age of cow.

Correlation coefficients between a.m. and p.m. and between a.m. and a.m. minus p.m. milk yields were 0.87 and 0.47 respectively (Schmit, 1960; Spahr and Ormiston, 1966; Ormiston et al., 1967; Putnam and Gilmore, 1969; Everett and Wadell, 1970). Similar published information in the last two decades is scarce, more so on exotic animals in western Nigeria, hence this reports.

Thirty German Holstein heifers imported between 1971 and 1973 into the University of Ibadan Teaching and Research farm were freely grazed rotationally on sown pastures at 0800-1100 and 1700-1800 hours, stall-fed freshly harvested forage during the hot sunny 1100-1700 hours, offered 1 kg dairy concentrate supplement per 2.5 kg milk produced, and given additional grass hay and wet brewer's grains during the dry October-March months. They were machine milked and later hand-milked twice daily (0600 and 1500 hours) and the weight of milk produced at each milking recorded. Possible veterinary care was also given. There was no record of whether the animals were of commercial or genetic stock.

Analysis of variace (Steel and Torrie, 1960) of 73 completed lactations recorded during 1971-81 among 23 of these animals showed that 3.64-4.54 kg and a maximum of 2.73 kg of milk were most frequently produced at each a.m. and p.m. milking respectively.

A.M. milk yield per day averaged 4.05 kg (range = 1.48-8.35 kg) compared with a mean daily p.m. yield of 2.90 (range = 0.99-6.98 kg). The mean a.m. yield thus exceeded p.m. yield by 1.15 kg (Table 1) as in previous reports due probably to the longer 15-hour intergal between p.m. and a.m. milking. It thus constituted 58.3% of the total daily milk yield while the mean daily p.m. yield was 71.6% of the average a.m. milk yield.

Yield at each milking was affected by lactation number. It increased from the first lactation, peaked at the fourth and declined later. Contrarily, the difference between a.m. and p.m. milk yields of heifers was larger than that of cows (second and later parities) due probably to better adaptation and greater maturity among adult animals.

Mean a.m. milk yields subsquent to miscarriages were 12.3 and 16.4% lower respectively than those initiated by successful pregnancies (Table 2). The decreases were more pronounced during the first three lactations, being 17.3, 51.9 and 22.2% respectively. In lactations subsequent to unsuccessful and full-term pregnancies, the average p.m. milk yield amounted to 68.7 and 72.1% of a.m. yield respectively while the average a.m. yield approximated 60% (59.3 and 58.1% respectively) of the total daily milk yield.

Mean a.m. plus p.m. milk yields of about 7 kg (Tables 1 and 2) suggested that the average Holstein heifer imported was a low milk yielder due probably to genetic and/or the prevailing environmental factors in western Nigeria.

Each a.m., p.m. and a.m. minus p.m. milk yield peaked during the first month of lactation and declined as lactation advanced. The differences in yields were largest during the second week of lactation.

Values of coefficients of variation in milk yields were high (Tables 1 and 2) due probably to the few lactations of the small number

TABLE 1: LACTATIONAL MORNING AND EVENING MILK YIELDS OF CERMAN HOLSTEIN CATTLE IN IBADAN

	Mean milk yield (kg/day)					
Milking time	1st lacta-tion	2nd lacta-tion	3rd lacta-tion	4th lacta-tion	5th lacta-tion	1st-7th lacta-tions
a.m.	4.07	4.25	4.13	4.62	3.42	4.05
c.v. (%)	40.4	47.4	34.1	41.4	47.0	46.0
p.m.	2.58	3.10	3.16	3.78	2.82	2.90
c.v. (%)	35.7	56.1	35.6	41.2	48.9	44.5
a.m. - p.m.	1.49	1.15	0.97	0.83	0.60	1.15
c.v. (%)	56.2	31.0	37.4	54.1	40.1	96.5
p.m.(%) a.m.	63.4	72.9	76.5	81.8	82.4	71.6
a.m.(%) a.m. + p.m.	61.3	87.8	56.7	55.0	54.8	58.3

c.v. = coefficient of variation

ABLE 2: INFLUENCE OF MISCARRIAGES AND NORMAL BIRTHS ON LACTATIONAL MORNING AND EVENING MILK YIELDS OF GERMAN HOLSTEIN CATTLE IN IBADAN

		Mean milk yield (kg/day)				
Type of birth	Milking time	1st lacta-tion	2nd lacta-tion	3rd lacta-tion	5th lacta-tion	1st-7th lacta-tions
	a.m.	3.40	2.11	3.44	4.41	3.62
	c.v. (%)	49.0	-	55.7	14.9	47.8
Abortions	p.m.	2.32	1.28	2.56	3.64	2.49
and	c.v. (%)	45.2	-	53.7	12.8	42.7
Stilibirths	a.m.-p.m.	1.52	0.83	0.88	0.77	1.13
	c.v. (%)	59.4	-	62.2	24.7	73.8
	p.m. (%) a.m.	60.4	60.7	74.5	82.6	68.7
	a.m (%) a.m. + p.m.	62.4	62.2	57.3	54.8	59.3
	a.m.	4.11	4.39	4.42	2.72	4.13
	c.v. (%)	39.8	47.0	20.8	61.8	45.8
	p.m.	2.63	3.22	3.41	2.24	2.98
Normal	c.v. (%)	34.4	55.1	23.5	66.9	44.4
	a.m. - p.m.	1.48	1.17	1.01	0.48	1.15
births	c.v. (%)	57.2	31.6	26.0	38.6	69.4
	p.m. (%) a.m.	63.9	73.3	77.1	82.2	72.1
	a.m. (%) a.m. + p.m.	61.0	57.6	56.5	54.9	58.1

c.v. = coefficient of variation

of animals studied and to liberal culling among the animals. They suggested, however, that selection for high milk yield was possible.

The following correlation coefficients (r) were obtained between the milk yields; a.m. and p.m., 0.94; a.m. and minus p.m., 0.38; a.m. plus p.m., 0.99; p.m. and a.m. minus p.m., 0.48; p.m. and a.m. plus p.m., 0.98. All the values were highly significant ($P < 0.01$) and in agreement with published values.

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