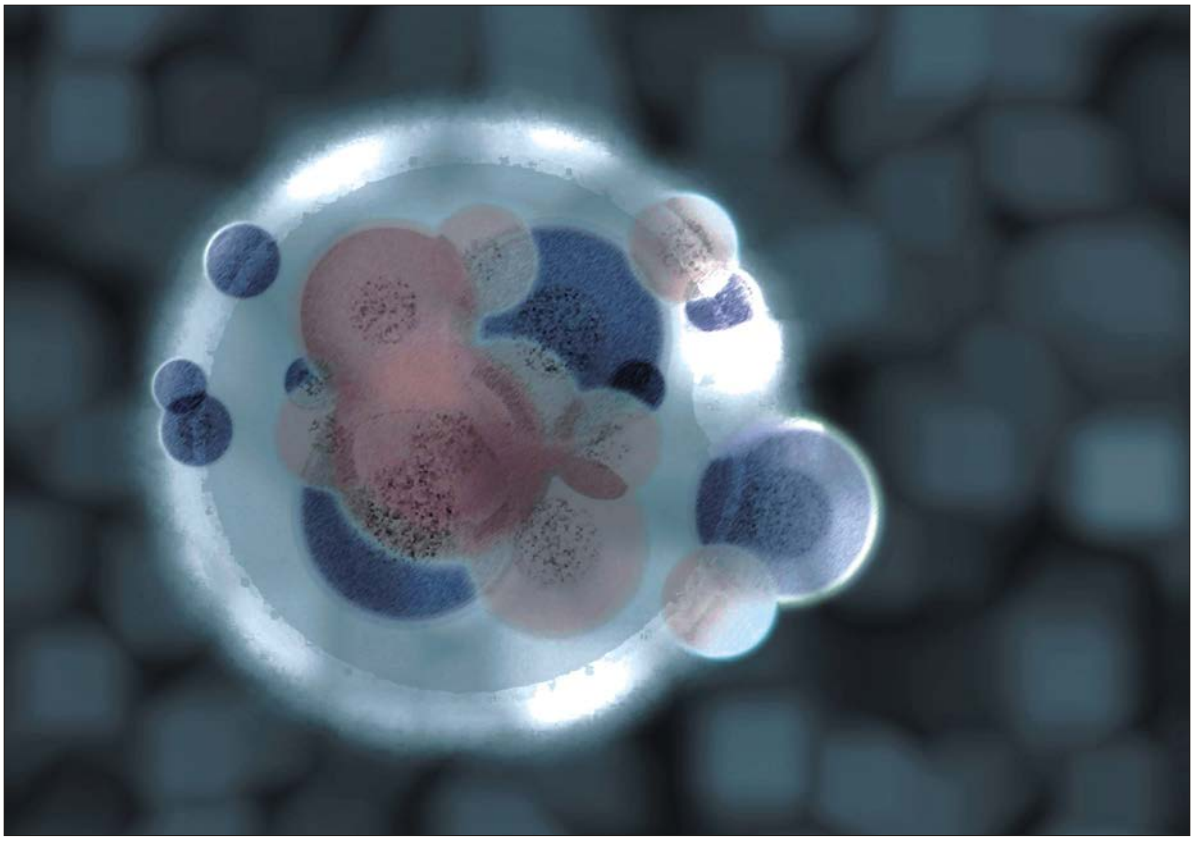

Journal of Biological Sciences

ISSN 1727-3048

science alert

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Journal of Biological Sciences 4 (2): 100-102, 2004
ISSN 1727-3048

Importance of Mammary System Conformation Traits in Selecting Dairy Cows on Milk Yield in Bangladesh

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Abstract: An experiment was conducted to find out the importance of various characteristics of mammary system and to study their relationship with milk yield in dairy cows during the period from October to November 2000. By a previously prepared module, 100 dairy cows were selected to collection of data for the various measurements and shapes of udder from the Bangladesh Agricultural University Dairy Farm and adjacent villages of University. The phenotypic correlation coefficients between udder measurements and test milk yield and between all possible combinations of udder measurements were significant ($P<0.01$), revealed that length, width and depth of udder were related to each other and also to the milk production. A bowl shaped udder with large proportion of secretory tissue with highest milk production was as an assets for a milch cow. It may be concluded that a well conformation of udder is to be considered for selecting dairy cows on milk yield.

Key words: Importance, dairy cows, udder, milk yield

INTRODUCTION

The udder (mammary system) of the cow is a most important physical asset. A large, strongly attached, well carried, quality udder is very important for heavy milk production and a long period of usefulness. The most important traits of udder are known as size, shape and placement of udder and teat, attachment, texture of udder and mammary veins. A bowl shaped udder with large proportion of secretory tissue and well placed teats is considered as an asset for a milch animal. Size and shape of teat is also considered important to decide the susceptibility of udder to milk yield. Moreover, these characters are believed to be associated with mastitis and milking machine. Several studies[1-4] have provided documented evidence for such hypothesis. But it is very unfortunate that no work has yet been conducted in Bangladesh in favour of this important issue. So, the present work was undertaken to measure the shape and size of udder of dairy cows and also to find out the relationship of udder characteristics on milk yield of dairy cows.

MATERIALS AND METHODS

The experiment was conducted during the period of October to November 2000. In order to achieve the objectives of the study a total of 100 dairy cows were selected from Bangladesh Agricultural University (BAU) Dairy Farm and surrounding villages of BAU campus. The following parameters were measured from each cow during the study period.

a) Milk yield (Kg day^{-1})
b) Length, width and depth of udder (cm)
c) Shape of udder.

The above mentioned informations were collected by researcher himself. It was found that most of the cows were milked twice a day, morning and evening. So, morning and evening milk yield was combined together with to get the actual milk yield of a cow for that day.

Length of the udder was measured with a rubber tape from the rear attachment of the udder along its sole, where fore udder blends smoothly with the body. 'Udder width' was measured by passing over the tape in between fore and rear teats from the near of stifle joint on one side to other side. On the other hand 'udder depth' was measured by subtracting the distance taken from the barn floor up to the udder floor from the distance taken from the barn floor to the base udder. A visual appraisal was made to evaluate the shape of udder. The udders were classed as bowl, round and goaty type as defined by Johnson and Rendel[5]. Statistical analysis such as per cent, mean, standard error, coefficient of variation, correlation coefficient were done to get clean picture from the collected data.

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RESULTS AND DISCUSSION

The mean values along with standard errors (S.E.) and coefficient of variation (C.V.%) for various udder measurements are shown in Table 1. The mean udder length, width and depth in dairy cows were 33.20±0.71 cm, 32.12±0.68 cm and 12.57±0.32 cm respectively. In the present study the length of udder (33.20±0.71 cm) was recorded slightly more than the udder width (32.12±0.68 cm). Udder depth (12.57±0.32 cm) was found smaller than that of length and width of udder in dairy cows. The result of the present study is supported by the findings of Yakusevich and Bud-ko[6].

The mean values along with standard error (S.E.) and coefficient of variation (C.V.%) for various udder measurements according to order of lactation are shown in Table 2. Udder length was less in 1st lactation and gradually increased up to 6th lactation. Udder width was less in 1st lactation and gradually increased up to 4th lactation and then declined up to 6th. However, the measurements of udder depth according to order of lactation did not show any systematic trend. The C.V. % of udder depth (24.10%) was relatively more variable than udder length (21.04%) and width (20.02%). Results except udder depth in this study are in partial agreement with the findings of Saxena[7].

Phenotypic correlation coefficients between various udder measurements and test milk yield and between all possible combinations of udder measurements in dairy cows are presented in Table 3. All the tree measurements viz. Length (0.70±0.06), width (0.76±0.06) and depth (0.68±0.07) were significantly ($P<0.01$) correlated with test milk yield. The correlation between all possible combinations of udder measurements such as length vs width (0.78±0.05), length vs depth (0.67±0.06) and width vs depth (0.78±0.05) were also significant thereby indicating that the udder measurements were proportionate among themselves. The results of this study agrees with the results of Saxena[7].

The frequency percent distribution of udder shape along with test milk yield is given in Table 4. The maximum number of dairy cows (65%) were found having round shaped udder followed by medium number of goaty (35%) and less number of bowl (20) shaped udder. However, the udder of dairy cows with bowl shaped yielded the maximum test milk yield (3.4±0.33 Kg), medium in goaty shaped udder (3.1±0.20 Kg) and less in round shaped udder (2.8±0.19 Kg). These findings were supported by Prajapati *et al.*[8].

It is clearly depicted from the foregoing discussion that, size and shape of udder are very important conformation traits which could play a vital role for the suitability of milking and economical milk production. So, everyone who works with or studies the characteristics of milking cows is suggested to consider the above informations about the udder characteristics for selecting dairy cows on milk yield.

Table 1: Mean, S.E. and coefficient of variation (C.V.%) values for various udder measurements (cm) in dairy cows

Udder measurements	Mean±S.E.	C.V.%
Length of udder after milking	33.20±0.71	21.04
Width of udder after milking	32.12±0.68	20.02
Depth of udder after milking	12.57±0.32	24.10

Significant at 0.5 % level

Table 2: Mean, S.E. and coefficient of variation (C. V. %) values for various udder measurements (cm) after milking in dairy cows according to order of lactation

Order of lactation	No	Udder Length (cm) Mean±S.E.	C.V.%	Udder width (cm) Mean±S.E	C.V.%	Udder depth (cm) Mean±S.E	C.V.%
1st	28	28.20±1.52	26.30	31.75±1.70	30.59	12.46±0.79	35.81
2nd	14	30.40±1.60	22.63	33.43±1.63	22.79	12.09±0.93	30.95
3rd	20	32.00±2.14	31.65	34.00±1.84	26.29	11.28±0.84	33.60
4th	29	35.05±1.40	25.30	34.04±0.77	15.90	14.01±0.36	16.90
5th	07	36.01±1.45	14.89	33.14±2.35	22.03	14.61±1.11	22.50
6th	02	38.20±0.50	5.59	28.50±0.50	2.48	11.00±0.00	05.00
Overall	100	33.31±0.71	21.04	32.12±0.68	20.02	12.57±0.32	24.10

Table 3: Phenotypic correlation coefficient values between test milk yield and udder measurements and among udder measurements

Character	Udder measurements Length	Width	Depth
Test milk yield	0.70±0.06**	0.76±0.06**	0.68±0.07**
Udder length		0.78±0.05**	0.67±0.06**
Udder width			0.78±0.05**

** Significant at 1 % level

Table 4: Percent frequency distribution of udder shapes along with test milk yield in dairy cows

Shape of Udder	No. of observations	Frequency (%)	Test milk yield (kg)
Bowl	20	20	3.4±0.33
Round	65	65	2.8±0.19
Goaty	35	35	3.1±0.20

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