required; however, there is a limit to the amount of extremely small particulate material which is compatible with distinguishing and accurately counting stained particles. Attempts to use coarse porosity filter paper (Whatman no. 1) for retention of particles directly from homogenized feces proved unsuitable, due to the large number of smaller particles whose appearance made quite uncertain their classification as to stained or unstained, and as to color.

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W. C. ELLIS
and
J. E. HUSTON

Department of Animal Science
Texas A&M University
College Station

References

Composition of Milk Produced by Red Dane and Red Poll Cattle

Abstract
Samples of milk were taken from 16 Red Dane, 25 Red Poll, 22 Holstein, and 24 Guernsey cows in University herds in the months of January, March, and May. Each sample was subjected to analysis for milk fat, protein, solids-not-fat, lactose, and ash content. Results of the analyses were subjected to analysis of variance and the Newman-Keuls sequential range test. Mean differences were considered to be significantly different when the difference attained a probability level of 0.01 or less.

Month and month by breed interaction effects were found to be nonsignificant sources of variation. In general, composition of milk from Red Dane cows tended to resemble that of Guernsey cows, while milk from Red Poll cows tended to resemble that from Holstein cows in composition.

The composition of milk produced by the major breeds of dairy cattle has been thoroughly investigated and is available in many textbooks and research reports. There is a dearth of information available in the United States about the composition of milk from Red Dane and Red Poll cattle. These two breeds are represented in this country by relatively few individual cows and herds. Davies (2) indicated that milk from Red Poll cows contained approximately 3.8% fat and 9.09% solids-not-fat. Euren (3) compiled data from the late Nineteenth and early Twentieth Centuries on the composition of milk from Red Poll cattle. His data indicated that milk from Red Poll cattle averaged 4.4% milk fat and 13.5% total milk solids. One purpose of this investigation was to estimate the composition of milk produced by Red Dane and Red Poll cattle. A second purpose was to compare the composition of milk from Red Dane and Red Poll cattle with the composition of milk from Holstein and Guernsey cattle.

Experimental Procedures
Samples of milk were taken from 16 Red Dane, 25 Red Poll, 22 Holstein, and 24 Guernsey cows in the University herds. Milk samples were collected in January, March, and May. The Babcock test was used to determine fat content, and the Orange G dye method to measure amount of protein in the milk. Milk samples were analyzed for solids-not-fat, using the small Watson lactometer. The method of Perry and Doan (4) was used to measure the amount of lactose present. The official method (1) was used to determine the ash content of milk samples.

The data were subjected to statistical analysis by the analysis of variance. Tests of significance of differences between breed means were accomplished by use of the Newman-Keuls sequential range test. Because of the large number of possible variations affecting the results, mean differences were considered to be statistically significant only if they met the probability level of 0.01.

Results and Discussion
Results from the statistical analyses of data from this study are presented in Table 1. The superscript letters in Table 1 indicate that there was no significant difference between that mean and any other mean in the same line bearing the
TABLE 1
Composition of milk from Red Dane, Red Poll, Holstein, and Guernsey cattle

<table>
<thead>
<tr>
<th>Constituent</th>
<th>Red Dane</th>
<th>Guernsey</th>
<th>Red Poll</th>
<th>Holstein</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protein (%)</td>
<td>3.55 ± .050</td>
<td>3.49 ± .047</td>
<td>3.21 ± .048</td>
<td>3.14 ± .048</td>
</tr>
<tr>
<td>Solids-not-fat (%)</td>
<td>9.17 ± .054</td>
<td>9.45 ± .043</td>
<td>8.82 ± .042</td>
<td>8.95 ± .044</td>
</tr>
<tr>
<td>Milk fat (%)</td>
<td>4.07 ± .090</td>
<td>5.49 ± .071</td>
<td>5.96 ± .070</td>
<td>5.71 ± .078</td>
</tr>
<tr>
<td>Lactose (%)</td>
<td>4.67 ± .058</td>
<td>4.71 ± .046</td>
<td>4.58 ± .044</td>
<td>4.54 ± .050</td>
</tr>
<tr>
<td>Ash (%)</td>
<td>0.76 ± .018</td>
<td>0.77 ± .006</td>
<td>0.75 ± .006</td>
<td>0.73 ± .006</td>
</tr>
</tbody>
</table>

* Mean values having the same superscript letter were not significantly (P ≤ .01) different.

The month and month by breed interaction effects were found to be nonsignificant sources of variation. Composition of milk from Red Dane cows tended to resemble closely that of milk from Guernsey cows, while composition of milk from Red Poll cows resembled closely that of milk from Holstein cows. The only significant differences between mean values for the Red Dane and Guernsey milks were those involving fat content and solids-not-fat content. There were no significant differences between the mean values of milks from the Red Poll and Holstein breeds.

The breeds fell into two groups as described above with regard to protein content. Three distinct groupings were observed with regard to solids-not-fat content, with the Guernseys having the highest content, the Red Danes being intermediate, and the Holstein and Red Polls having the lowest content. Milk fat analyses showed that the Guernsey milk was much higher than milk from the other breeds in fat content. Among the three other breeds, the milk fat content of milk from the Red Polls was intermediate and did not differ significantly from the milk fat level in milk from either Red Dane or Holstein cows. The milk fat content of milk from Holsteins was significantly lower than that of milk from Red Danes. Breed did not affect lactose content and had only a minor effect on the ash content of milk.

D. R. FRAZEUR 2 and T. G. MARTIN
Department of Animal Sciences
Purdue University
Lafayette, Indiana

References

2 Present address: Monsanto Company, 800 North Lindbergh Road, St. Louis, Missouri.