

Functional Type in the Dairy Cow and Its Economic Value to the Industry

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It appears that our profession, especially as related to cattle, is adjusting to meet the needs of our time. Much has been said about the advantages of a "companion animal practice" as compared to running from emergency to emergency in a "fire engine" type of practice. The bovine practitioner must adjust in the direction of preventive medicine and management consultation, if he is to render a service rewarding both to himself and his client. The theme of this convention is in keeping with this concept. We hope that our efforts here will contribute constructively.

There is an obvious need for efficient cattle in meeting the nutritional needs of our society. There are many factors that affect efficiency in cattle production. Perhaps the most important is longevity. As veterinarians, our contribution has been directly to longevity in the application of medical knowledge to prevent and to cure disease processes.

It is my purpose today to show that functional type traits are of true economic value, for they directly affect longevity. I will maintain that type traits are directly linked to many disease processes, and that it is appropriate for veterinarians to communicate with their clients relative to improvement of such type traits by means of genetic selection.

Although we will look primarily at the dairy cow, especially the Holstein-Friesian, there will be obvious application to other areas of bovine practice.

Unfortunately, in recent years the dairy cow has been subjected to very narrow evaluative criteria. Several major influences in our country have stressed pounds of milk production and ignored all the other factors affecting efficiency. These influences have contributed, in the Holstein breed, to the neglect of important heritable type traits, affecting longevity under stress. Primary areas, showing the results of this neglect, are udders, feet and legs. Compounding the problem has been the change from small herds on pasture to large, confined herds on concrete, while intensified nutritional programs have forced cows to approach their genetic potential for milk production. It is easy under these conditions for cows with undesirable udders to become chronic mastitis problems, and for cows with undesirable feet and legs to develop corns, foot rot, infections, crampiness, and a general inability to move. As these problems occur, production drops, and visible signs of estrus may disappear. When these cows are culled the cause

is recorded as low production, poor health, or sterility. The real culprit, genetically transmitted physical weakness, is lost sight of.

Today most areas of our breed are making efforts to correct the problem. More interest is being shown in total solids produced, rather than concentrating only on pounds of milk; and the fact that functional soundness affects longevity, and is economically worth selecting for, is being accepted. Every dairyman has known the disappointment of spending three years producing and raising a replacement heifer only to find that her udder was so poorly supported that it could not be kept healthy, and that he had to discard as much milk as he shipped because of antibiotic content. And every bovine practitioner has known the frustration of trying to treat such an individual.

Perhaps these cows are self-eliminating, but many hang on long enough to produce at least one daughter. If we are to raise daughters of such cows, and we must, for so many of our Holsteins show at least some of these weaknesses, it is imperative that they be sired by bulls with the ability to improve upon the weaknesses of their dams.

Various breed organizations, artificial insemination organizations, and private companies have developed guides to evaluate type traits, and with the aid of computers, to report statistically what the prominent bulls of the various breeds seem to transmit to their offspring. It may seem somewhat confusing to have such a multiplicity of systems, but each has some merit. Each breeder will use the system that most easily meets his needs. If he is buying semen from only one stud he is likely to use the system developed by that stud. If he is buying from several sources, he will probably use a more universal system.

You have before you a booklet entitled *Descriptive Type Classification*, courtesy of the Holstein Association, which describes how the breed tries to evaluate and report structural characteristics. This information is intended to assist breeders in selecting matings which will improve the wearability of our future herds. This booklet is a summation of the work of trained classifiers who evaluate cattle across our nation, and in other countries, on a regular schedule. In excess of 270,000 evaluations were done in the United States in 1976. Until recently only registered cattle were evaluated. When the computer correlates the

Chart 1

This chart shows the classification scores of the national production leaders for milk and fat of the Holstein breed as reported in the June 25, 1977, issue of *The World*.

Age	Cl. Sc.	2X 305 Milk		Cl. Sc.	2X 305 Fat
Jr. 2	90	27749	1.	72	1175
	86	27640	2.	78	1138
	85	27580	3.	-	1024
	82	26090	4.	85	972
	86	26010	5.	81	966
Sr. 2	-	27130	1.	80	1097
	80	25840	2.	85	1094
	81	25800	3.	88	1060
	82	25330	4.	86	1046
	82	25310	5.	81	999
Jr. 3	81	32759	1.	81	1353
	80	30760	2.	86	1308
	83	29740	3.	90	1265
	83	29590	4.	88	1206
	88	29200	5.	88	1196
Sr. 3	86	34970	1.	85	1558
	86	31460	2.	67	1292
	80	30700	3.	90	1248
	90	30230	4.	86	1233
	88	30120	5.	91	1227
Jr. 4	88	33060	1.	82	1451
	75	32720	2.	85	1252
	86	31910	3.	80	1235
	82	31430	4.	88	1215
	84	31370	5.	80	1203
Sr. 4	85	33130	1.	88	1246
	86	32960	2.	-	1224
	82	32520	3.	82	1205
	91	32370	4.	84	1202
	87	31810	5.	84	1200
Mature	91	50314	1.	93	1906
	92	44144	2.	91	1861
	91	43380	3.	92	1672
	91	41420	4.	85	1562
	91	38890	5.	88	1458
Sr. Aged	88	27190	1.	90	1076
	90	25520	2.	87	1048
	80	25270	3.	92	1003
	92	25050	4.	91	994
	86	24570	5.	88	981

The average classification score for all Holsteins is 80.58, from 76.8 at two years to 85.7 at twelve years.

evaluation data with the pedigree information, it is possible to derive a statistical picture of the type traits most common in the daughters of each active bull, and within specific bloodlines. This information is published in a Sire Summary, in conjunction with production information for all tested cows as provided by the cow testing associations. This gives the breeder valuable information on which to build his own breeding program. When the cost of semen for the specific bulls is known it becomes possible to choose those bulls that have the most to offer a breeding program, taking both short-term and long-term economics into consideration.

Ideally, the bulls chosen would produce only daughters with high production and excellent type. Of course, there are two individuals contributing to each offspring, and the variables of genetics are so numerous that every bull sires a wide range of type

traits and production potential. Those bulls that most consistently sire above average daughters soon become much in demand, and the cost of their semen rises accordingly. In actual practice, we attempt to mate cows with the bull that will most complement her, strengthening her weaknesses and enhancing her strengths.

As in *Playboy*, the centerfold of this booklet may be the most interesting. It represents a classifier's worksheet, on which he records the physical characteristics of each animal. Every registered female that has freshened at least once, and every registered male over two years of age, within the herd being classified, is scored. As more and more daughters of a given bull become classified, the summations relative to that bull become more and more statistically significant. If a bull has 50 daughters, in ten or more herds, representing different manage-

Chart 2
 Animals at Leprechaun Over 7 Years of Age
 28 Cows - Total Herd 240. All Production 305 2X

Cow No.	Birthdate	Cl.	Age	Milk	%	Fat
1	5-10-69	85	7-7	26397	4.4	1170
3	5-12-69	83	6-11	24581	4.2	1026
5	8-27-69	81	6-5	18375	3.5	649
9	2-24-68	80	8-1	18798	4.4	832
12	4-19-68	93-3E	8-4	25862	4.2	1073
23	8-10-70	80	4-3	20823	3.5	733
30	8-25-66	91-3E	9-0	25167	2.8	707
40	7-13-70	87	5-7	30452	3.5	1065
71	11- 5-70	85	4-5	19950	3.6	711
92	7-22-68	88	8-1	17489	3.2	555
94	5- 9-68	88	6-10	26324	4.1	1069
97	5-10-70	84	4-0	22175	3.0	665
102	11-10-70	87	4-8	21003	3.9	814
105	5-16-69	83	6-8	25863	4.1	1053
108	7-21-69	84	6-5	16269	3.4	553
111	8-31-70	78	5-1	24263	4.2	1018
114	11-12-68	82	6-9	21501	4.1	889
120	11-24-68	86	6-10	18818	4.6	863
125	7-27-69	80	5-5	27470	3.5	958
174	7- 5-70	85	5-7	24430	3.8	919
176	5-28-70	79	5-1	16488		582
179	5- 9-70	87	4-2	20924	3.7	780
197	10-17-70	80	4-11	24846	3.4	838
199	11-10-70	85	5-0	18534	4.1	767
201	8-12-69	86	6-1	26414	3.6	946
226	10- 4-70	82	5-0	20626	4.2	868
378	10-23-70	88	5-9	18552	4.4	808
393	9- 6-69	92	5-10	23204	3.4	800
28 Ave. Class - 84.6 = 103.0 BAA						
Average Production of These 28 -				22235		847
240 Cows M.E. Average				21388		735

ment and environmental conditions, then we feel that the results of this summation will reasonably predict the traits that bull will transmit to his offspring.

A look at a recent sire summary will show that it is not necessary to sacrifice production in order to improve type traits. While being far from a majority, there are numerous bulls that are plus both for production and type.

The two charts were done to show that functionally sound cows have greater longevity and produce better than their contemporaries. Chart 1 is a compilation of the classification scores of all the National Holstein Production leaders for milk and fat by age group. I suggest:

1. The average classification score of these production leaders far exceeds the breed average.
2. Those cows in the advanced age groups have dramatically high classification scores.
3. It may be deduced that there is a correlation between physical soundness and both production and longevity.

Chart 2 shows that cows within my own herd that have lasted beyond seven years of age are higher than average both for production and classification scores.

I believe it all goes together. The physically sound have the strength with which to resist stress and disease processes and the physical ability to produce. This means greater longevity and production.

The only thing a bovine practitioner has to sell is a service that leads to greater longevity and production of his client's cattle. In order for this service to be complete, it would seem necessary to include an understanding and appreciation of the importance of type traits and the genetic transmission thereof. It is my hope that, as practitioners, we might become more aware of the benefits to be achieved in a client's herd health program by application of the ever-increasing amounts of genetic information coming off the computers. As we become more aware, we are not only able to render a better service, but also open up new lines of communication with our clients.

The speakers following me are highly qualified and will discuss the manner in which we evaluate structural soundness; how we try to measure the heritability of important traits; and what we can expect in the way of progress from carefully designed matings.