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DIFFERENCES AMONG APPRAISERS IN THE NEW YORK TYPE APPRAISAL PROGRAM

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ABSTRACT

The purpose of the New York type appraisal program is to attempt to rate type traits objectively. Approximately 34 traits are included, of which 25 are rated by the appraiser and 9 by the herd manager. This paper reports differences among 18 appraisers, including 8 professional judges, 7 New York Artificial Breeders' Cooperative fieldmen, and 3 other sire selection personnel all of whom rated 38 cows in a single herd. There were statistically significant differences ($P \leq .05$) among appraisers for all traits. Average scores of the professionals were different from those of the fieldmen for all except six traits. Differences among the professionals were also large, as were the differences among the fieldmen. The results suggest that the fieldmen as a group appraised with as much consistency as the group of professional judges.

The Extension division of the Animal Husbandry Department of the New York State College of Agriculture at Cornell University in 1953 began a program of objective rating of type traits, in an attempt to uncover characteristics early in life which would influence herd life. This report considers the differences among appraisers, professional judges, fieldmen of the New York Artificial Breeders' Cooperative, their sire analysts, and the chairman of their Holstein sire selection committee when faced with the same decision situation—the same cows in one herd.

EXPERIMENTAL PROCEDURE

All appraisers were to rate all cows in a Holstein herd for all traits. The list of traits and the way they were broken apart for analysis are shown in Table 1. Where the ratings for a trait were in a linear pattern, the scores for a trait were analyzed as a single variable. In other cases, when the possible scores were not linear, each possible score was treated as a different binomial variable with scores zero or one. The eight professional judges were accredited in New York. There were seven NYABC fieldmen, two NYABC sire analysts, and the dairyman chairman of the Holstein sire selection committee. Fifty cows from the Griswold herd of Cortland, New York, were included in the experiment. Only 38 of these cows were rated by all 18 appraisers.

The analysis of variance was for a factorial arrangement—18 appraisers and 38 cows—with one observation on each variable per subclass.

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The sum of squares for 17 degrees of freedom associated with appraisers was partitioned into single degree of freedom contrasts. The analyses are summarized in Table 2.

The columns of the analysis of variance are described below.

Source of variation	Degrees of freedom
Among appraisers	17
Professionals versus fieldmen	1
Among professionals	7
Among fieldmen	6
Professionals versus other (analysts and dairyman)	1
Among others	2
Among cows	37
Error	629

All significance tests were at the ($P \leq .05$) level.

RESULTS AND DISCUSSION

The general result, as can be seen from Table 2, is that there were statistically significant differences among appraisers for all traits except for a few of the (0 or 1) variables within a trait. The scores of the professionals were significantly different from those of the fieldmen for 19 of the 25 traits.

The six traits not scored significantly different by the two groups were shoulder (8), hind legs—sideview (16), hind legs—rear view (17), pasternus (18), teat position—rear (53-55), and teat position—fore (56-58). There were several significant differences within the professional and fieldmen groups for four of these traits; shoulder scores, hind legs—side view, hind legs—rear view, and pasternus.

For only two traits where there were sig-

TABLE 1
Assignment and description of type appraisal variables

No.	Variable	Possible values
3	Dairy character	1—Sharp, 2—moderate, 3—coarse or thick
4-7	Head ^a	1—Typical, 2—plain, 3—beefy, 4—weak
8	Shoulder	1—Not winged, 2—slightly winged, 3—severely winged
9-15	Back ^a (hip to shoulder)	1—Straight, 2—high chine, 3—low loin, 4—low chine, 5—roached, 6—slightly sway back, 7—severely swayed
16	Hind legs (side view)	1—Too straight, 2—nearly straight, 3—intermediate, 4—sickled
17	Hind legs (rear view)	Toe out: 1—None to slight, 2—moderate, 3—severe
18	Pasterns	1—Strong, 2—intermediate, 3—weak
19	Depth of body	1—Deep, 2—intermediate, 3—shallow
20-27	Rump levelness ^a	1—Nearly level, smooth pelvic arch, 2—nearly level, notched pelvic arch, 3—nearly level, high pelvic arch, 4—nearly level, high tail head, 5—slightly sloping, relatively smooth pelvic arch, 6—plain with low tail setting, 7—(26) not used, 8—sloping
28	Rump rear view	Thurls: 1—High, square, 2—intermediate, 3—low
29	Heel depth	1—Deep, 2—intermediate, 3—shallow
30	Upstandingness	1—Tall, 2—medium, 3—low set
31-35	Udder shape ^a (rear)	1—Long, 2—intermediate, 3—short, 4—bulgy, 5—funnel
36-40	Udder shape ^a (fore)	1—Long, 2—intermediate, 3—short, 4—bulgy, 5—funnel
41	Udder texture	1—Collapsed after milking, 2—intermediate, 3—meaty
42	Depth of udder	1—Too deep, 2—deep, 3—intermediate, 4—shallow
43-47	Levelness of udder floor ^a	1—Nearly level, 2—slight tilt, 3—fore higher than rear, 4—pronounced tilt, 5—rear higher than fore
48	Height rear udder attachment	1—High, 2—intermediate, 3—low
49	Strength of rear udder attachment	1—Strong, 2—intermediate, 3—loose, 4—broken away
50	Strength of fore udder attachment	1—Strong, 2—intermediate, 3—loose, 4—broken away
51	Udder halving (rear view)	1—Floor nearly flat, 2—cleft 1-2FW, 3—cleft 2-3FW, 4—more than 3FW (Finger width FW)
52	Udder quartering (side view)	1—Floor nearly flat, 2—cleft 1-2FW, 3—cleft 2-3FW, 4—cleft over 3FW
53-55	Teat position ^a (rear)	1—Plumb, 2—pointing forward, 3—pointing sideways
56-58	Teat position ^a (fore)	1—Plumb, 2—pointing forward, 3—pointing sideways
59-64	Teat placement ^a	1—Well spaced, 2—rear too close, 3—side view too close, 4—all bunched, 5—front too wide, 6—front and rear too wide

^a Indicates trait was broken into several (0 or 1) subvariables for analysis.

nificant differences between the professionals and fieldmen was there much agreement among the professionals and among the fieldmen—depth of body and udder quartering.

The professionals as an average group were more often in agreement with the three other appraisers than they were with the average of the fieldmen—20 of 61 significant differences between professionals and others, as opposed to 28 of 61 significant comparisons between

professionals and fieldmen. The 11 traits for which scores showed no average significant difference between the professionals and the group of three were: shoulder, hind legs—side, hind legs—rear, heel depth, upstandingness, udder-shape—rear, udder texture, depth of udder, levelness of udder, height rear udder attachment, and strength of rear udder attachment.

These results do not show whether the professionals or fieldmen are more likely to be

TABLE 2
F-values for analyses of variance of type appraisal scores

Trait no.	Men	P vs. F	Comparison			Among O	Among cows	Error M.S.
			Among P	Among F	P vs. O			
3	363.0	10.4	6.2	7.3	10.1	3.3	173.3	0.262
4	144.9	24.9	9.9	3.9	7.2	2.5	68.2	0.149
5	16.7	7.5	10.6	2.1	1.6	1.0	7.9	0.124
6	3.6	0.7	1.7	3.1	0.0	1.0	4.1	0.028
7	6.7	26.9	1.5	0.9	11.7	1.4	8.6	0.045
8	246.6	0.7	4.8	11.1	0.2	3.4	114.7	0.380
9	160.4	6.7	6.1	3.3	9.8	4.9	85.1	0.121
10	11.7	8.7	5.0	8.9	1.2	1.9	8.2	0.063
11	5.3	3.7	2.2	1.1	2.2	1.1	4.6	0.055
12	1.9	0.1	1.2	0.5	4.3	2.9	2.1	0.012
13	1.7	2.5	2.6	0.0	0.0	1.6	1.6	0.006
14	12.1	8.2	2.7	3.4	0.9	1.4	13.3	0.078
15	1.1	1.1	2.2	0.0	0.6	0.0	1.0	0.001
16	1,048.1	0.7	7.4	20.6	1.0	7.2	488.5	0.287
17	465.4	2.1	16.0	7.6	0.4	0.4	216.8	0.190
18	453.4	0.6	4.8	5.5	13.8	8.1	216.9	0.280
19	450.3	78.6	2.2	4.1	4.9	8.8	212.7	0.237
20	20.6	28.3	9.1	2.0	0.2	11.5	14.6	0.089
21	11.8	1.8	7.2	3.5	8.9	1.0	8.2	0.079
22	58.8	21.7	8.2	5.5	5.5	3.6	32.7	0.157
23	14.7	0.0	4.0	2.0	1.0	0.3	35.3	0.036
24	8.1	0.0	2.2	3.0	0.2	1.0	10.5	0.063
25	2.3	1.2	0.5	2.1	0.1	1.1	2.6	0.024
27	4.5	0.1	2.1	1.3	1.9	0.0	21.3	0.017
28	529.9	8.7	5.2	10.6	3.9	3.9	252.4	0.247
29	428.3	11.1	7.8	5.0	0.1	1.9	197.9	0.354
30	510.5	17.5	3.6	10.8	0.0	0.3	249.8	0.244
31	33.0	3.9	18.7	15.4	0.3	1.4	13.4	0.122
32	49.5	2.6	4.1	3.5	0.5	3.8	22.9	0.226
33	16.7	3.8	7.4	4.8	1.7	0.3	11.1	0.107
34	2.7	1.7	0.8	1.8	0.2	1.2	3.0	0.029
35	5.0	6.8	1.7	2.3	2.6	9.3	3.8	0.034
36	19.6	2.8	10.8	4.8	1.7	8.2	12.3	0.098
37	57.4	0.2	7.0	1.0	0.9	13.1	27.8	0.202
38	18.0	15.4	8.0	1.4	5.6	0.5	11.4	0.119
39	10.4	14.7	2.3	5.7	3.7	4.0	8.6	0.068
40	3.1	0.3	1.1	1.3	5.5	11.4	1.6	0.012
41	294.7	8.7	6.6	7.4	0.3	11.5	135.7	0.350
42	1,538.7	100.1	9.2	9.0	0.0	1.5	724.8	0.183
43	126.0	3.9	1.8	13.4	0.1	0.8	63.3	0.148
44	19.4	4.6	2.8	8.2	0.2	0.6	11.2	0.138
45	3.4	0.5	2.0	0.9	1.6	0.8	4.4	0.037
46	3.5	0.2	2.2	1.7	0.0	0.4	8.6	0.024
47	5.5	1.9	1.3	7.8	2.8	5.1	4.1	0.022
48	604.2	22.7	4.6	14.2	1.6	4.2	287.0	0.210
49	508.5	7.3	5.4	25.6	0.3	8.3	243.9	0.224
50	446.7	90.4	17.6	12.4	7.1	2.6	214.7	0.250
51	1,260.6	88.3	8.4	15.4	21.0	3.1	581.9	0.205
52	420.6	15.3	6.7	3.3	4.8	0.2	201.9	0.167
53	905.3	0.2	0.8	2.2	8.0	7.0	425.9	0.039
54	4.2	1.9	0.7	2.4	2.9	7.4	7.9	0.025
55	2.4	0.4	1.4	0.3	2.7	0.0	6.9	0.021
56	356.9	0.6	4.0	5.4	17.9	11.6	168.1	0.084
57	3.5	2.1	1.6	1.0	0.0	1.4	9.0	0.026
58	11.2	0.1	2.0	4.1	22.7	11.1	8.7	0.066
59	101.9	21.8	3.6	10.3	6.8	2.3	49.1	0.169
60	25.3	3.6	11.1	13.5	2.2	1.6	17.1	0.087
61	2.4	1.7	1.1	3.0	0.0	0.7	2.7	0.013
62	1.8	0.1	1.6	1.7	1.5	0.0	2.4	0.009
63	23.1	85.9	17.8	0.5	6.9	6.2	8.9	0.081
64	2.2	0.0	1.1	0.6	2.9	4.5	5.9	0.014

conservative in their scoring, i.e., whether they tend to score near the middle range of possible values. The indirect evidence from the wide variation among both professionals and fieldmen is that conservatism in scoring is not a special attribute of members of either group. Members of either group may score conservatively or radically different from the average of the group.

The variation due to differences among cows was significant for nearly all variables and for all traits.

CONCLUSIONS

Differences between the professional and fieldmen groups do not seem much more important than differences among members of the same group. The professionals did not appear

any more consistent from one to the other than the fieldmen.

The primary purpose of the experiment was to determine whether the fieldmen were qualified for type appraising. Results indicate that the fieldmen as a group appraised with as much consistency as the group of professional judges.

The next question as to whether more than one appraiser should do the appraisal work is unanswered. The variation of each appraiser might be a criterion to use for the purpose of answering this question. Observing the variation among appraisers would likely lead to the conclusion that as many appraisers as possible should be used. If appraiser differences are not considered in use of the collected data, they should be well randomized over the different herds and sire groups.