

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Faculty Papers and Publications in Animal
Science

Animal Science Department

May 1972

Association of Type Traits with Reasons for Disposal

L. Dale Van Vleck

University of Nebraska-Lincoln, dvan-vleck1@unl.edu

H. D. Norman

Cornell University

Follow this and additional works at: <https://digitalcommons.unl.edu/animalscifacpub>



Part of the [Animal Sciences Commons](#)

Van Vleck, L. Dale and Norman, H. D., "Association of Type Traits with Reasons for Disposal" (1972).
Faculty Papers and Publications in Animal Science. 432.
<https://digitalcommons.unl.edu/animalscifacpub/432>

This Article is brought to you for free and open access by the Animal Science Department at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Faculty Papers and Publications in Animal Science by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

Association of Type Traits with Reasons for Disposal

L. D. VAN VLECK and H. D. NORMAN¹
Department of Animal Science
Cornell University, Ithaca, New York 14850

Abstract

Reasons for disposal of 3,475 cows from 188 New York Holstein herds were compared with type appraisal and milk yield in first lactation to study the relationship between type traits measured early in life and later reasons for disposal. Reasons for disposal were grouped as production (32%), udder (22%), reproduction (27%), inabilities or disease (8%), workability (3%), type (3%), and other (5%). Few traits measured before 49 months of age had any significant value in predicting the reason for a cow's eventual disposal. These results in addition to earlier studies of heritability suggest that type traits measured in the first lactation have only a limited value in selection for longevity.

Introduction

A major argument favoring selection for components of type is that certain type characteristics favor a long productive herd life or conversely may indicate why a cow will eventually be culled from the herd. Most previous studies have shown low correlations between type traits and herd life (3, 5). In 1961 a type appraisal project was initiated by the Extension Division of the Department of Animal Science of the New York State College of Agriculture to study these problems. Previous reports have described the data, the traits measured, and the results of analyses of fixed effects, heritabilities and correlations among type, production, and herd life. This study attempted to measure correlations between type appraisal traits and reasons for disposal.

Data Collection and Analysis

All the 188 Holstein herds were part of the type appraisal project described in more detail in (1). They were appraised biannually with approximately half first appraised in odd and half in even numbered years with a goal of

four appraisals per herd. After each herd inspection a listing of the animals in that herd was returned to the dairyman with a summary of his herd appraisal.

Prior to the next scheduled appraisal a carbon copy was mailed to the herd owner who was asked to account in his own words for those cows that were no longer in the herd. An exception to this procedure was in collecting reasons after the last appraisal which was requested by mail 2 years and 1 year, respectively, after the 1967 and 1968 appraisals. The letter asked the dairyman to indicate the first or primary reason why the cow left the herd and then any other reasons in order of importance. Specific reasons were requested rather than general terms such as sold for beef or dairy purposes.

This method of asking the dairyman to write his own primary and secondary reasons for disposal was used to minimize biases. An earlier study (4) showed that with a precoded list of reasons there is a tendency for the dairyman to select the first reason appearing on the list that applies to that cow. Since most cows leave the herd for a combination of reasons, the person coding sometimes picks the second, third, or fourth reason of importance instead of the primary one.

By any method of examining reasons for disposal there are problems in communication. The terminology of reasons for disposal is probably interpreted in slightly different ways by every person. The written reason "udder trouble" could have meant mastitis, udder injury, or might have been used to describe a broken udder attachment. Since some of the reasons could have a range of meanings and others are rather specific, these reasons were coded with a larger number of categories than desired.

The reasons for disposal were not coded until after they had been received for all years. A practice coding was made on approximately one-third of the data to produce reasonable consistency. Then the entire set of data was coded and rechecked within 2 weeks by one individual (HDN) as to the reason for sale or death. Although as many as three reasons, if given, were coded for an animal, few had more than two reasons listed. Thus, analyses

Received for publication May 10, 1972.

¹ Present address: Animal Science Research Division, USDA, Beltsville, Maryland 20705.

TABLE 1. Frequencies of reasons for disposal and seven major groupings of reasons for disposal (3314 responses for primary reasons for disposal).

1. Production (32.5%)	
Unsatisfactory, 31.9%; lack of persistency, .2%; low test, .2%; didn't start to milk, .1%.	
2. Udder (23.4%)	
Broken, 1.5%; poor attachments, 3.5%; trouble, .5%; <4 quarters, 1.0%; injury, 1.3%; teat injury, 4.9%; mastitis, 10.4%; edema, .2%; teats too long or short, .1%.	
3. Reproduction (26.6%)	
Lepto, .1%; slow breeder, .9%; unable to breed, 12.0%; "breeding trouble", 8.3%; cystic ovaries, .8%; abortion, 2.6%; mummified fetus, .3%; calving problems, 1.0%; calving paralysis, .2%; "split" pelvis, .1%; prolapsed uterus, .2%; retained placenta, .1%; multiple births, .2%; uterine infection, .1%.	
4. Inabilities or Disease (7.7%)	
Arthritis, .3%; bloat, .1%; cancer, .2%; crampy, .3%; crippled, .1%; "disease", .1%; forage poisoning, .1%; hardware, 1.5%; heart trouble, .2%; infection, .5%; internal disorder, .2%; ketosis, .4%; milk fever, 1.2%; peritonitis, .1%; pneumonia, .2%; rheumatism, .2%; "illness", .7%; spastic, .2%; T B, .1%; displaced abomasum, .5%; old age, .4%; lameness, .3%.	
5. Workability (2.7%)	
Hard milker, 1.3%; milk leak, .6%; poor disposition, .8%; sucker, .1%.	
6. Type (3.1%)	
Feet and legs, 2.0%; small, .2%; "poor" type, .8%; others less than .1%—rump, shoulders, hip.	
7. Other (4.0%)	
Accident, .7%; died—no reason given, .9%; grade, .1%; injury, 1.4%; broken bones, .3%; lung ailment, .1%; paralysis, .1%; poor condition, .1%; lumpy jaw, .1%; tumor, .1%; downer, .1%.	

were conducted only with primary and secondary reasons for disposal. These 100 specific reasons later were put into seven major groups as shown in Table 1 because numbers of cows in each of the 100 groups were generally small.

Reasons for disposal were then collated with the type appraisal and production data for

each animal. Analyses included only cows which had been type appraised before 49 months of age. Table 2 gives the fraction of cows listed in the seven groups separately for cows with different opportunities to remain in the herd before termination of the project. A brief description of the categories for each type appraisal trait is in Table 3. The appendix

TABLE 2. Fraction of cows culled for various primary and either primary or secondary reasons by groups based on opportunity to remain in the herd^a.

Opportunity ^b group	Reason given as	Reason for disposal							Number of responses
		Produc- tion	Udder	Repro- duction	Dis- ease	Worka- bility	Type	Other	
Up to 4 years	Primary	.321	.233	.271	.078	.027	.030	.040	3,144
	Primary or secondary	.298	.245	.247	.081	.041	.049	.038	4,055
Up to 6 years	Primary	.311	.239	.268	.085	.027	.030	.040	2,447
	Primary or secondary	.293	.251	.246	.089	.039	.045	.039	3,161
Up to 8 years	Primary	.312	.241	.265	.098	.022	.031	.032	1,272
	Primary or secondary	.296	.248	.245	.105	.029	.045	.031	1,638
No limit	Primary	.325	.234	.266	.077	.027	.031	.040	3,314
	Primary or secondary	.300	.245	.244	.080	.042	.050	.039	4,300

^a Fraction of total responses: primary values would be number of cows with that primary reason for disposal divided by total number of primary responses (cows); primary or secondary values would be number of cows with that primary reason plus number of cows with that secondary reason divided by total number of primary plus secondary responses.

^b Cows that were appraised in the herds with a chance to remain this number of years before completion of the project. Cows in the 8 year group were also included in the 6 year group, etc.

TABLE 3. Type appraisal traits and categories of measurement.

Type trait:	(a,1)	(Categories, numeric values)		
		(b,2)	(c,3)	(d,4)
Management traits:				
1 Excitability	Dull	Quiet	Nervous	
2 Feeding speed	Slow	Average	Fast	
3 Mastitis	No	Yes		
4 Mastitis from injury	No	Yes		
5 Ketosis	No	Yes		
6 Milk fever	No	Yes		
7 Breeding problems	No	Yes		
8 Cystic ovaries	No	Yes		
9 Milking speed	Slow	Average	Fast	
10 Milk leak	No	Yes		
11 Edema: intensity	Little	Moderate	Severe	
12 Edema: persistency	One week	Two weeks	More than two	
Body traits:				
14 Sharpness	Thick	Moderate	Sharp	
15 Typical head	No	Yes		
16 Strength of head	Weak	Intermediate	Coarse	
17 Shoulder tightness	Severely winged	Slightly winged	Tight	
18 Back arch	Severely swayed	Low	Straight	High
19 Hock straightness	Sickled	Intermediate	Straight	Too straight
20 Legs (toe out)	Severe	Moderate	None to slight	
21 Pasterns	Weak	Intermediate	Strong	
22 Body depth	Shallow	Intermediate	Deep	
23 Rump slope	Sloping	Slight	Nearly level	
24 Pelvic arch	Not smooth	Smooth		
25 Tail setting	Low	Intermediate	High	
26 Thurl height	Low	Intermediate	High	
27 Heel depth	Shallow	Intermediate	High	
28 Upstandingness	Low	Medium	Upstanding	
Udder traits:				
29 Length (rear)	Short	Intermediate	Long	
30 Bulginess (rear)	No	Yes		
31 Funnelness (rear)	No	Yes		
32 Length (front)	Short	Intermediate	Long	
33 Bulginess (front)	No	Yes		
34 Funnelness (front)	No	Yes		
35 Quality	Meaty	Intermediate	Collapsed after milking	
36 Depth	Shallow	Intermediate	Deep	Too deep
37 Forward slope ^a	Rear above	Level	Slight forward tilt	Fore above
38 Height (rear)	Low	Intermediate	High	
39 Strength r. attachment	Broken away	Loose	Intermediate	Strong
40 Strength f. attachment	Broken away	Loose	Intermediate	Strong
41 Halving ^b	Flat	Cleft 1-2FW	2-3FW	≥3FW
42 Quartering	Flat	Cleft 1-2FW	2-3FW	≥3FW
43 Rear teats forward	No	Yes		
44 Rear teats sideways	No	Yes		
45 Fore teats forward	No	Yes		
46 Fore teats sideways	No	Yes		
47 Rear teat spacing	Too close	Well spaced	too wide	
48 Fore teat spacing	Too close	Well spaced	too wide	
49 Rear to front teat sp.	Too close	Well spaced		

^a Category e for this trait with a value of 5 was 'pronounced tilt'.

^b FW = finger width.

of the report by Norman and Van Vleck (1) gives a more complete description as well as the original traits and categories from which the 49 traits in this study were derived. Table 4 shows the fraction of cows which were classified in each category for each trait.

Since there were only slight differences in the analyses of different opportunity groups, results are reported only for the no limit on opportunity group which would include all cows that were given a reason for disposal.

TABLE 4. Fraction of cows in each category for each type trait for all cows^a leaving the herd.

Trait	Category				
	1	2	3	4	5
1 Excitability	.02	.79	.20		
2 Feeding speed	.03	.49	.48		
3 Mastitis	.85	.15			
4 Mastitis from injury	.96	.04			
5 Ketosis	.97	.03			
6 Milk fever	1.00	.00			
7 Breeding problems	.91	.09			
8 Cystic ovaries	.96	.04			
9 Milking speed	.99	.41	.50		
10 Milk leak	.94	.06			
11 Edema: intensity	.55	.41	.04		
12 Edema: persistency	.62	.32	.05		
14 Sharpness	.01	.41	.58		
15 Typical head	.19	.81			
16 Strength of head	.02	.97	.02		
17 Shoulder tightness	.02	.23	.75		
18 Back arch	.00	.20	.68	.11	
19 Hock straightness	.08	.49	.42	.01	
20 Legs (toe out)	.03	.46	.51		
21 Pasterns	.07	.43	.50		
22 Body depth	.04	.48	.48		
23 Rump slope	.05	.18	.77		
24 Pelvic arch	.78	.22			
25 Tail setting	.10	.81	.09		
26 Thurl height	.15	.57	.28		
27 Heel depth	.10	.63	.28		
28 Upstandingness	.08	.43	.48		
29 Length (rear udder)	.20	.63	.17		
30 Bulginess (rear udder)	.95	.05			
31 Funnelness (rear udder)	.95	.05			
32 Length (front udder)	.13	.69	.18		
33 Bulginess (front udder)	.88	.12			
34 Funnelness (front udder)	.99	.01			
35 Quality of udder	.04	.33	.62		
36 Depth of udder	.08	.66	.26	.01	
37 Forward slope to udder	.04	.72	.18	.04	.02
38 Height (rear udder)	.11	.63	.26		
39 Strength r. attachment	.00	.05	.36	.58	
40 Strength f. attachment	.00	.04	.26	.70	
41 Halving of udder	.01	.46	.50	.04	
42 Quartering of udder	.80	.19	.01	.00	
43 Rear teats forward	.96	.04			
44 Rear teats sideways	.96	.04			
45 Fore teats forward	.95	.05			
46 Fore teats sideways	.90	.10			
47 Rear teat spacing	.16	.82	.02		
48 Fore teat spacing	.01	.89	.10		
49 Rear to front teat spacing	.05	.95			

^a The number of cows reported for primary reasons for disposal ranged from 3,077 to 3,314 for the various type traits with most traits having over 3,300 valid reports. The number of reports of primary and secondary reasons ranged from 4,009 to 4,298 with most traits having over 4,200 valid reports. Fraction for primary and secondary reasons for disposal were all within .01 of values given.

Results and Discussion

The fractions of cows in each type category for cows leaving the herd for each of the seven general disposal reasons were compared to the overall fractions using the chi-square test.

Table 5 lists the traits which were statistically different ($P \leq .05$) for each reason for disposal. Whether the changes in the fraction in each group agree with pre-conceived ideas about what are desirable categories can be seen by referring to the list of traits. For example, depth of udder is significant in several groups, but the changes are in different directions. Among those culled for production .056 more had shallow udders, .016 more had intermediate udders, .069 fewer had deep udders, and .003 fewer had too deep udders than cows culled for all reasons. But among those culled for udder problems .024 fewer had shallow, .006 fewer had intermediate, .083 more had deep, and .007 more had too deep udders than all cows culled. Results for strength of fore udder attachment present a similar pattern. More cows with strong fore attachments were culled for low production while fewer such cows were culled for udder problems than average. Notable exceptions from the list in Table 5 are the feet and leg traits except that more cows with weak and strong pasterns and fewer with intermediate pasterns were culled for type than for all reasons and that more cows with shallow heel depth and fewer with intermediate and high depth were culled for other reasons than overall.

Simple correlations ignoring herd effects (2) between reason for disposal and type appraisal or milk yield appear in Table 6. All correlations were low which suggest the appraisal ratings do not predict accurately why a cow will leave the herd. Reason for disposal was listed as zero or one. Milk yield was taken as deviation from herdmate average. The correlation analyses included only appraisals for the 1,130 cows appraised before 49 months of age having a first lactation milk record and a reason for disposal. When all the traits were considered jointly to predict reason for disposal, the squared multiple correlations were also small (Table 7) even including first lactation milk yield to predict disposal for low production.

Conclusions

Few traits measured before 49 months of age have any significant value in predicting the eventual reason for a cow's disposal. Early

TABLE 5. Traits which had fractions in type categories significantly ($P \leq .05$) different from the overall fractions for cows culled for various primary and either primary or secondary reasons. Expressed as differences from overall fractions.

Trait	1	2	Category 3	4	5	Chi- square ^a
Culled for production (960 and 1,156) ^b						
1 Excitability	.007	-.028	.021			7.1 ^c
2 Feeding speed	.014	.054	-.068			23.5
5 Ketosis	.013	-.013				5.1
11 Edema: intensity	.047	-.040	-.007			10.1
14 Sharpness	.006	.045	-.051			12.2
17 Shoulder tightness	-.010	-.026	.036			9.6
29 Length (rear udder)	.032	-.003	-.030			11.4
36 Depth of udder	.056	.016	-.069	-.003		63.5
38 Height (rear udder)	.019	.012	-.031			7.4 ^c
40 Strength f. attachment	.000	-.011	-.040	.052		14.4
41 Halving of udder	-.003	.052	-.038	-.012		14.0 ^c
46 Fore teats sideways	.022	-.022				5.8
49 Rear to front teat spac.	.014	-.014				4.3
Culled for udder (712 and 969)						
2 Feeding speed	-.013	-.047	.060			13.9
3 Mastitis	-.056	.056				18.8
4 Mastitis from injury	-.015	.015				5.0
5 Ketosis	-.013	.013				3.8
7 Breeding problems	.021	-.021				4.1 ^c
11 Edema: intensity	-.053	.032	.021			15.0
12 Edema: persistency	-.051	.030	.021			11.0
14 Sharpness	-.005	-.036	.040			6.1
28 Upstandingness	.019	.014	-.032			6.9 ^d
31 Funnelness (rear udder)	-.013	.013				3.9 ^d
32 Length (front udder)	.024	-.040	.016			6.1
34 Funnelness (front udder)	-.008	.008				5.0 ^d
36 Depth of udder	-.024	-.066	.083	.007		37.8
37 Forward slope to udder	-.008	-.035	.031	.002	.012	12.5
39 Strength r. attachment	.006	.030	.010	-.045		26.3
40 Strength f. attachment	.006	.010	.029	-.045		14.5
41 Halving of udder	.010	-.027	.008	.008		9.2
42 Quartering of udder	-.030	.027	-.001	.003		9.8 ^d
44 Rear teats sideways	-.021	.021				8.6
45 Fore teats forward	-.020	.020				6.1
46 Fore teats sideways	-.046	.046				17.8
47 Rear teat spacing	-.020	.004	.016			12.1
Culled for reproduction (807 and 961)						
7 Breeding problems	-.033	.033				12.2
11 Edema: intensity	-.003	.019	-.016			7.1 ^c
36 Depth of udder	-.023	.044	-.020	-.001		10.1 ^c
38 Height (rear udder)	-.024	.013	.011			6.0 ^d
44 Rear teats sideways	.019	-.019				8.6
47 Rear teat spacing	.018	-.005	-.013			10.9
Culled for inabilities or disease (231 and 312)						
3 Mastitis	.062	-.062				7.5
4 Mastitis from injury	.028	-.028				6.7 ^d
11 Edema: intensity	-.040	.059	-.019			6.7 ^d
15 Typical head	-.056	.056				5.3
26 Thurl height	.035	-.103	.067			10.0
28 Upstandingness	-.016	-.055	.071			6.4 ^d
29 Length (rear udder)	-.077	.072	.004			9.5
36 Depth of udder	-.039	-.024	.061	.002		8.7
38 Height of rear udder	-.005	-.093	.099			12.5
40 Strength f. attachment	-.003	-.020	.078	-.054		10.5
44 Rear teats sideways	-.026	.026				4.3 ^c

Table 5 (Continued)

Trait	1	2	Category 3	4	5	Chi- square*
Culled for workability (83 and 168)						
1 Excitability	-.006	-.120	.128			9.2
2 Feeding speed	.014	-.136	.122			6.8 ^e
9 Milking speed	.176	-.092	-.084			33.8
10 Milk leak	-.049	.049				3.8 ^e
11 Edema: intensity	-.069	.039	.030			6.3 ^d
12 Edema: persistency	-.084	.054	.030			6.0 ^d
Culled for type (94 and 206)						
2 Feeding speed	.027	.026	-.053			6.4 ^d
5 Ketosis	-.035	.035				3.8 ^e
8 Cystic ovaries	-.044	.044				5.4 ^e
11 Edema: intensity	-.002	-.068	.070			14.2 ^e
17 Shoulder tightness	-.023	.091	-.068			6.6 ^e
21 Pasterns	.044	-.081	.037			10.2 ^d
23 Rump slope	.030	.034	-.064			6.4 ^d
25 Tail setting	.048	-.020	-.028			7.1 ^d
26 Thurl height	.060	.012	-.072			8.8 ^d
33 Bulginess (front udder)	-.063	.063				7.6 ^d
40 Strength f. attachment	.007	.059	.080	-.146		15.7
Culled for other reasons (129 and 161)						
27 Heel depth	.089	-.060	-.029			11.5
32 Length (front udder)	-.035	.087	-.053			6.0 ^d
33 Bulginess (front udder)	-.058	.058				4.9 ^d

* Chi-square significant for records with primary reason for disposal and for records with either primary or secondary reason for disposal; primary chi-square and fractions reported unless otherwise subscripted.

^b Number of disposals for primary reason and for either primary or secondary reason.

^c Chi-square significant only for the records with primary reasons for disposal; primary values reported.

^d Chi-square significant only for records with either primary or secondary reason for disposal; primary and secondary chi-square and fractions reported.

TABLE 6. Correlations^a between primary reason for disposal and first lactation type appraisal and milk yield.

Trait	Primary Reason						
	Pro- duction	Udder	Repro- duction	Dis- ease	Worka- bility	Type	Other
Management traits:							
1 Excitability	.09	.01	-.08	-.02	.03	-.06	-.00
2 Feeding speed	-.04	.07	-.02	-.02	-.00	-.01	.03
3 Mastitis	-.01	.11	-.06	-.05	.03	-.02	-.01
4 Mastitis from injury	-.03	.04	.01	-.04	.02	-.01	.02
5 Ketosis	-.05	.04	-.01	.03	-.00	.02	-.02
6 Milk fever	-.02	-.02	.05	-.01	-.01	-.01	-.01
7 Breeding problems	.01	-.02	.02	-.02	-.04	.04	-.01
8 Cystic ovaries	-.04	.00	.03	.00	-.04	.07	-.00
9 Milking speed	.03	-.01	.03	-.01	-.12	-.03	.02
10 Milk leak	.03	-.03	.03	-.08	.02	-.02	.03
11 Edema: intensity	-.07	.10	-.07	.00	.07	.07	-.01
12 Edema: persistency	-.02	.07	-.08	.00	.05	.07	-.02
Body traits:							
13 Body weight	-.04	.03	.01	.06	-.04	-.05	.01
14 Sharpness	-.09	.05	.01	.05	-.02	.02	.02
15 Typical head	.00	.01	-.03	.03	-.05	-.04	.06
16 Strength of head	.00	-.03	.02	-.03	.03	-.03	.04

Table 6 (Continued)

Trait	Primary Reason						
	Pro- duction	Udder	Repro- duction	Dis- ease	Worka- bility	Type	Other
17 Shoulder tightness	.02	-.03	.04	-.06	-.00	-.03	.02
18 Back arch	-.03	-.02	.01	.05	.04	-.02	.01
19 Hock straightness	.00	.02	-.03	.02	.06	-.06	-.02
20 Legs (toe out)	-.01	-.00	.02	.03	-.01	-.07	.03
21 Pasterns	-.01	-.01	-.00	-.00	-.00	.03	.03
22 Body depth	-.05	.04	.00	-.01	.02	-.02	.04
23 Rump slope	.00	.06	-.04	.01	-.01	-.05	-.00
24 Pelvic arch	.04	-.04	-.00	-.04	.05	.00	-.01
25 Tail setting	.04	.02	-.04	-.03	.00	-.05	.04
26 Thurl height	.00	-.01	.04	-.02	-.05	-.04	.04
27 Heel depth	-.01	-.03	.04	-.01	.01	.01	.01
28 Upstandingness	-.02	-.02	.03	.06	.02	.00	-.06
Udder traits:							
29 Length (rear)	-.07	.01	.01	.04	.04	-.04	.05
30 Bulginess (rear)	-.01	-.00	-.01	.03	.04	-.05	.03
31 Funnelness (rear)	-.02	.01	.01	.04	-.03	-.01	-.02
32 Length (front)	-.01	-.01	.01	.02	.04	-.06	.03
33 Bulginess (front)	-.03	.02	-.02	.00	.07	.04	-.00
34 Funnelness (front)	-.01	.05	.00	-.02	-.02	-.02	-.03
35 Quality	-.01	-.04	.04	-.01	-.03	.03	.04
36 Depth	-.10	.12	-.06	.06	.03	.00	.02
37 Forward slope	-.05	.05	-.01	.04	.01	-.02	-.03
38 Height (rear)	-.06	.03	-.01	.05	-.02	-.03	.06
39 Strength r. attachment	-.00	-.05	.02	.03	.01	-.02	.03
40 Strength f. attachment	.04	-.08	.04	-.01	-.01	-.04	.02
41 Halving	-.07	.01	.01	.07	-.01	.04	.00
42 Quartering	-.03	.06	-.01	-.02	-.02	.04	-.02
43 Rear teats forward	.02	-.01	.04	-.05	-.01	-.02	-.01
44 Rear teats sideways	.02	.03	-.06	.06	-.03	.02	-.04
45 Fore teats forward	-.04	.06	.04	-.05	.01	-.01	-.05
46 Fore teats sideways	-.03	.04	-.02	.05	-.03	.01	-.00
47 Rear teat spacing	.03	.05	-.03	-.03	-.02	-.03	-.02
48 Fore teat spacing	.05	.02	-.00	-.04	-.04	-.00	-.05
49 R. to f. teat spacing	-.02	.03	.04	-.01	-.05	-.02	-.00
50 Milk	-.40	.17	.15	.11	-.01	.07	-.04
Disposal reasons:							
51 Production	..	-.37	-.42	-.20	-.12	-.12	-.15
52 Udder	..	..	-.33	-.16	-.09	-.09	-.12
53 Reproduction	..	..	..	-.18	-.10	-.11	-.13
54 Disease	..	..	..	..	-.05	-.05	-.06
55 Workability	..	..	..	..	..	-.03	-.04
56 Type	..	..	..	..	..	..	-.04

* The critical value for testing the null hypothesis that the correlation coefficient of the population from which the sample was taken is zero is .061 ($P \leq .05$).

TABLE 7. Squared multiple correlation coefficients for regression of reason for disposal on first lactation type appraisal traits and milk deviation from herdmate average and means for the reason for disposal groups.

	Traits	Reason for culling						
		Production	Udder	Reproduction	Disease	Workability	Type	Other
Primary or Secondary	49 type + milk	.180	.094	.075	.059	.074	.032	.042
	49 type	.066	.081	.048	.054	.074	.032	.040
	milk alone	.148	.024	.022	.009	.000	.000	.004
	mean ^a	.38	.26	.32	.10	.06	.07	.05
	fraction							
Primary	49 type + milk	.194	.082	.081	.066	.060	.055	.038
	49 type	.072	.065	.052	.060	.060	.053	.038
	milk alone	.160	.029	.024	.012	.000	.004	.002
	mean ^b	.32	.22	.27	.08	.03	.03	.05
	fraction							

^a Reason for disposal was coded 1 if that reason was listed as primary or secondary importance in the cow leaving the herd, coded 0 otherwise.

^b Coded 1 if listed as primary importance in the cow leaving the herd, coded 0 otherwise.

mastitis and udder edema somewhat predict disposal for udder difficulty as does slow milking speed for workability. Deepness of udder has a small correlation with disposals for udder problems while shallower udders have a similar correlation with disposals for low production. High milk yield has a negative relationship to disposal for low production but smaller positive relationships to disposals for udder, reproductive, and disease problems. More cows with slow milking speed than faster milkers are culled for workability. Fewer cows with strong fore udder attachments are culled for type, but more cows with strong fore udder attachments are culled for low production than cows with weaker attachments.

Low production, reproductive problems, and udder difficulties (mastitis and breakdown) were the major reasons given for why cows were sold from the herd.

The data are restricted in that broad groupings of reasons for disposal had to be made. Yet the results as well as results of previous

studies of heritability suggest that type traits measured in the first lactation have only limited value in selection for longevity.

References

- (1) Norman, H. D., and L. D. Van Vleck. 1972. Type appraisal: I. Effects of age and stage-of-lactation on type ratings. *J. Dairy Sci.*, 55:1706.
- (2) Norman, H. D., and L. D. Van Vleck. 1972. Type appraisal: II. Variation in type traits due to sires, herds and years. *J. Dairy Sci.*, 55:1717.
- (3) Norman, H. D., and L. D. Van Vleck. 1972. Type appraisal: III. Relationships of first lactation production and type traits with lifetime production. *J. Dairy Sci.*, 55:1726.
- (4) O'Bleness, C. V., L. D. Van Vleck, and C. R. Henderson. 1960. Heritabilities of some type appraisal traits and their genetic and phenotypic correlations with production. *J. Dairy Sci.*, 43:1490.
- (5) Specht, L. W., H. W. Carter, and L. D. Van Vleck. 1967. First classification score and length of herd life. *J. Dairy Sci.*, 50:1690.