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Beef Carcass Evaluation Contest

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This bulletin was prepared by J. C. Miller, professor and head of the Department of Animal Science, and John H. Landers, Jr. and W. Dean Frischknecht, Extension animal science specialists, Oregon State University.

The contest described was held at the 1962 Pacific International Livestock Exposition in Portland, Oregon. It was sponsored by the Oregon Beef Cattle Improvement Association, the Oregon Cattlemen's Association, the Pacific International Livestock Exposition, and Oregon State University.

Appreciation for making the contest possible is extended to Kienow's Food Stores of Portland, the Oregon Beef Council, the Armour Packing Company, the Market Supply Company of Portland, and the progressive cattle breeders who entered their steers in competition.

Beef Carcass Evaluation Contest

Introduction

"Mr. Paulus, that's the most beautiful roast I've ever seen!" This was Mrs. Murphy's reaction when she stopped at the super market to pick up the standing rib roast she'd ordered for a dinner in honor of her husband's boss. She'd been specific . . . it must be Choice grade, between 7 and 8 pounds, nicely marbled and *not too fat!*

Mr. Paulus hadn't disappointed her; the roast he brought out was just to her order. She was very pleased—until she heard the price! Really, she hadn't realized it would be so high, what with her rancher friend and his wife talking about the price they were getting for cattle these days. It looked pretty obvious that somebody was getting rich at the expense of the consumer. She knew a standing rib roast was one of the most desirable cuts, but that hardly explained the price she was being charged.

Mr. Paulus was glad to have the opportunity to explain that part of the cost was because he trimmed his cuts the way his customers like them—with less than one half inch fat cover. In fact, he'd trimmed almost $1\frac{3}{4}$ pounds of fat from this 8-pound roast. He explained that he gets only $1\frac{1}{2}$ cents per pound for the fat trim and that his loss has to be spread over the cuts he sells.

Mrs. Murphy accepted the roast knowing it would please her husband's boss, but feeling upset with what seemed to be too high a price to the consumer.

Mrs. Murphy's experience is repeated many times daily by other shoppers at super markets. Why is it necessary to trim off up to 25-30% of the

carcass weight of many beef carcasses to prepare cuts for the retail trade? Because Mrs. Murphy won't buy the cuts with that much fat on them. The consumer doesn't want it, the retailer doesn't want it, and the packer doesn't want it, yet it comes with the carcass. Nobody wants it, yet some one pays for it. Who? The consumer, yet she doesn't want it and doesn't take it home with her.

The fat trim which the retailer sells at $1\frac{1}{2}$ cents per pound adds materially to the consumer price of beef. It also cost the feeder more than he got for it when he sold the live animal. Why then, does the feeder finish his cattle to that degree of wastiness? Because he is trying to make choice quality cattle which command a premium price. Unfortunately, cattlemen and meat men cannot consistently identify quality carcass grades in the live animal. Furthermore, cattle differ widely in their lean-to-fat ratio, even when the same age, on the same feed, and fed to the same slaughter weight. Degree of marbling largely determines quality grade. Some cattle will marble to choice grade with less than one half inch fat cover over the rib, while others may require an inch or more outside fat to reach choice grade. These differences are largely hereditary, which means the lean-fat ratio can be improved by selection.

Identification of breeding stock that will produce the most desirable market animals for all segments of the beef business is a major problem confronting the industry. The fast growing, high gaining, well muscled animal that

will yield a quality carcass of popular weight with a minimum of waste fat trim is desired by the breeder, feeder, processor, and retailer and should be less expensive to the consumer. Fortunately for producers, the larger

framed, heavier muscled kind also make faster and cheaper gains. If beef is to continue to be America's first choice at the meat counter, it *must* remain competitive in price.

The 1962 Contest

Current trends in meat merchandising, consumer preference, and carcass evaluation studies have created an active interest in carcass contests and methods of on-foot identification of carcass differences. The 1962 contest was held for the purpose of focusing attention on the differences in value of beef carcasses within the same quality grade. It is hoped that such contests will help to alert all segments of the beef industry to these differences, and lead to merchandising slaughter cattle according to their true value. This in turn should provide the necessary incentive for breeders and feeders to do a better job of satisfying consumer preference.

Eighteen steers consisting of 7 Angus, 5 Hereford, and 6 Shorthorns were entered in the contest by 10 breeders from 4 states. They were entered as junior yearlings (calved between January 1 and April 30, 1961) or summer yearlings (calved between May 1 and August 31, 1961). Minimum weight of 1,000 pounds was required for junior yearlings and 800 pounds for summer yearlings. Four steers failed to meet the weight requirements for junior yearlings and were eliminated from competition.

After they were weighed and photographed, the steers were placed on foot Friday morning, October 12, by a committee of four competent judges, consisting of two breeders, a commission man, and a University professor. Immediately after judging, the steers were

trucked to the Armour Packing Plant where they were slaughtered. The carcasses were graded by two USDA graders on October 15. The 10 top carcasses were selected by a committee of 4, including the 2 graders, D. A. Barnard, Meat Buyer for Kienow's Food Stores, who purchased the carcasses, and a University meats specialist. Carcasses were identified by number. None of the selection committee had seen the live animals.

Because pre-weighing treatment was not uniform for all steers, carcass weights do not provide valid comparisons of dressing percent. Following the grading and selection, all carcasses were measured and photographed. The wholesale rib from the right side of each of the top 10 carcasses was displayed in a refrigerated case at the Pacific International Livestock Exposition on Tuesday, October 16, and for the duration of the show. Preliminary carcass data was also released at that time.

The left side of the carcasses aged until Tuesday, October 23, when they were broken down into trimmed retail cuts. To insure uniformity, 10 of Kienow's meat cutters, under the supervision of D. A. Barnard, working on a disassembly line basis, cut and trimmed the carcasses for retail sale. Oregon State University personnel observed and recorded the results.

All carcasses graded low choice or higher. The following statement is taken from Mr. Barnard's report:

"The valuation was placed on them starting from the standard of 45¢ per pound packing house rail value. They were cut against a 16¢ per pound retail market value standard price list mark up, which with labor, operating cost, and advertising cost produces about 1¢ per pound net for the retailer. It is interesting, yet astounding and alarming, to note that there is a 13.56 cents per pound difference in the value of these cattle from the top to the bottom for the retailer when cut for sale. In these tests, it can all be traced to the amount of outside, inside, and internal carcass fat with the smaller amount of red meat tissue to size of carcass that make the difference in the retail value of these cattle."

As noted in Table 1, the top carcass (No. 5) had a retail value of \$62.76 per 100 pounds, while the bottom carcass (No. 14) was worth only \$49.89 per 100 pounds. At the wholesale level, these carcasses were worth \$47.53 and \$33.97 per 100 pounds, respectively. Using the wholesale values and assuming that hide and offal cover the cost of slaughter (standard procedure), steer No. 5 was worth \$28.50 per 100 pounds on foot and steer No. 14 was worth \$21.60, a difference of \$6.90 per 100 pounds or \$69 on a 1,000 pound steer. Both carcasses graded low choice and probably both steers would have sold for the same price under current marketing procedure.

It is of interest (Table 2) that 4 Hereford, 3 Angus, and 3 Shorthorn carcasses were selected in the top 10, indicating that there are good ones in all breeds and no breed has a monopoly.

The percent bone obtained by cutting and trimming for retail is almost constant (Figure 1). It is also of interest to note the relation between percent fat trim and percent consumer cuts. Figure 2 shows a straight line relationship between percent fat trim and retail value of carcass. It is obvious

that within comparable grades, fat trim is by far the most important factor determining the true retail value of the carcass. This points up the need for an accurate and practical means of determining the lean-fat ratio or cutability of a slaughter animal and its carcass. Furthermore, it reveals the weakness of our present marketing system, where all too frequently high cutability animals sell too low and wasty ones sell for more than they are worth.

Because the steers were shown by breed and by age (junior and summer yearlings), the groups were so small that on-foot placings do not have much meaning. However, steer No. 17 was the unanimous choice of the four judges for grand champion, yet his carcass ranked fifth in dollar value per hundred pounds. Steer No. 5 which produced the top value carcass was placed third in the summer yearling Hereford class, and steer No. 8 which produced the second place carcass was the fourth place summer yearling. Carcasses produced by the champion Angus steer and the champion Shorthorn steer were not selected among the top 10 carcasses for breaking down into trimmed retail cuts, because they were considered too fat by the judging committee.

The estimated yield of trimmed retail cuts (Table 2) and the corresponding yield grades made by the USDA graders ranks the cutability of the carcasses almost exactly in the same order as their actual retail cut out value. For example, the dual grade of carcass No. 5 is Choice 2+, while that of carcass No. 14 is Choice 5. The remaining eight carcasses are relatively close, and, except for No. 13, were all given a Choice 3 grade. On the basis of these 10 carcasses, it appears that dual grading offers a practical and reasonably

Table 1. Summary of Cutting Data

Rank in carcass value	Car-cass no.	Percent trimmed cuts		Percent steaks and roasts	Percent lean trim	Percent fat trim	Percent shank and soup-bone		Percent cutting loss	Whole-sale value/cwt.	Live animal value/cwt.	Retail value/cwt.
		Hind-quarter	Fore-quarter				Percent bone	Percent bone				
1	5	23.0	31.1	46.9	23.1	14.0	3.4	11.3	1.3	\$47.53	\$28.52	\$62.76
2	8	22.5	27.8	45.6	24.4	15.6	2.6	11.1	0.7	46.13	28.00	60.80
3	3	21.5	26.3	42.3	23.8	18.5	2.6	11.2	1.6	42.93	25.46	57.96
4	6	21.5	27.2	42.2	24.1	17.8	3.0	11.6	1.3	42.75	24.90	57.41
5	17	21.6	27.5	43.1	20.5	20.7	3.7	10.4	1.6	41.54	25.57	55.83
6	18	20.5	25.8	40.8	22.7	21.1	3.6	10.5	1.3	40.13	24.53	55.44
7	13	20.1	27.0	40.6	20.0	23.1	4.3	10.1	1.9	40.00	24.40	55.10
8	4	19.4	25.6	39.5	23.4	22.2	2.8	10.4	1.7	37.99	22.84	53.57
9	1	19.1	25.6	38.1	24.3	22.4	3.8	10.3	1.1	38.11	23.56	53.19
10	14	18.1	23.8	35.7	21.8	27.6	4.2	9.5	1.2	33.97	21.63	49.89

Table 2. Summary of Slaughter and Carcass Data

Rank in carcass value	Animal no.	Breed	Live wt.	Cold carcass wt.	Dressing percent ¹	USDA carcass grade			Est. yield trimmed cuts ⁴	Yield grade ⁵	Fat thickness over 12th rib	Rib-eye area per 100 lbs. carcass
						Conformation ²	Marbling ³	Quality				
									<i>Percent</i>	<i>Inches</i>	<i>Square inches</i>	
1	5	Hereford	910	546	60.0	C-	Mt.	Choice-	53.8	2+	0.3	2.72
2	8	Hereford	840	510	60.7	C-	Sl.+	Choice-	51.6	3	0.4	2.37
3	3	Angus	880	522	59.3	C-	Mt.+	Choice	51.3	3	0.4	2.16
4	6	Hereford	1,025	597	58.3	C-	Sm.+	Choice-	51.0	3	0.4	2.12
5	17	Hereford	900	554	61.6	C	Mdt.	Choice+	49.7	3	0.7	2.18
6	18	Angus	965	590	61.1	C	Mdt.+	Choice+	51.6	3+	0.3	2.35
7	13	Shorthorn	895	546	61.0	C-	Mdt.	Choice+	49.4	4	0.6	1.97
8	4	Angus	890	535	60.1	G+	Sl. Ab.-	Choice	50.4	3	0.7	2.10
9	1	Shorthorn	880	544	61.8	G+	Mt.+	Choice-	50.3	3	0.5	2.10
10	14	Shorthorn	1,090	694	63.7	C	Mdt.-	Choice-	45.5	5	1.1	1.94

¹ Preslaughter treatment not uniform.

² C = Choice; G = Good.

³ Marbling: Sl. Ab. = slightly abundant; Mdt. = moderate; Mt. = modest; Sm. = small; Sl. = slight.

⁴ Estimate made by USDA graders based on area of rib eye, thickness of fat covering, kidney knob, trim fat, carcass weight and conformation.

⁵ Yield or cutability grade combined with quality grade comprises the dual grade.

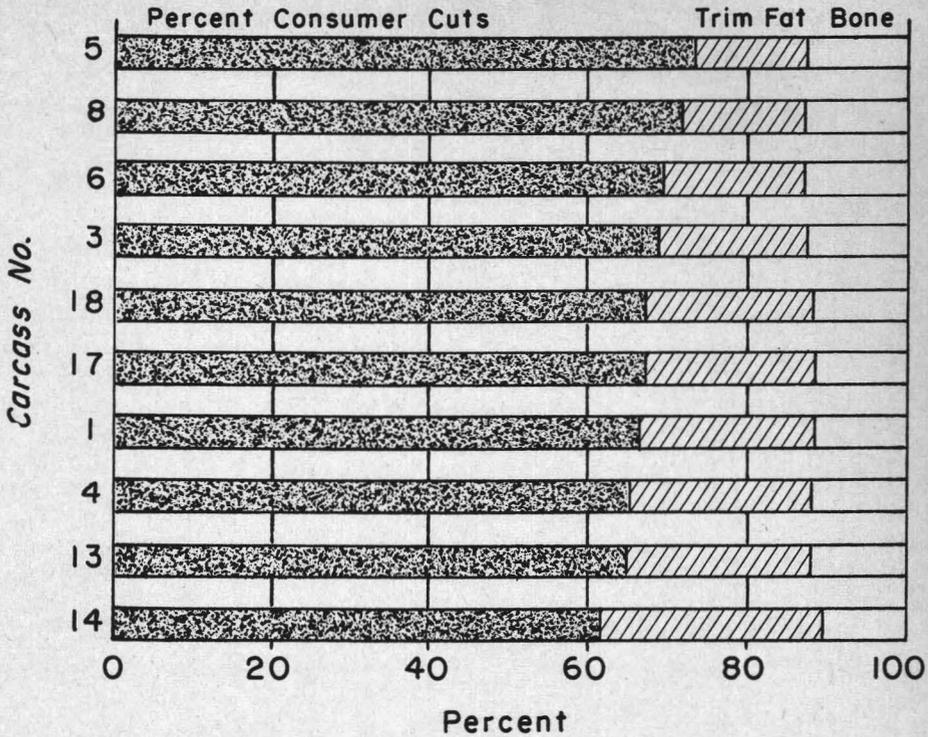


Figure 1. Results of the retail cutting test.

accurate means of evaluating the cutability of beef carcasses.

In view of the wide differences in true value of beef carcasses within the same quality grade, it is obvious that present systems of merchandising cattle and carcasses do not reflect these differences. Although fatness or degree of finish is influenced by length of feeding period, it is an established fact that the lean to fat ratio varies within comparable lots of cattle of the same age and fed for the same length of time. Muscling and the lean to fat ratio are hereditary. So is the ability to gain rapidly and economically. Accordingly, cattlemen should select for muscling and for rate and economy of gain. Fortunately, feeding trials followed by carcass cutting tests reveal that the

growthy, large framed type with good muscling make the fastest and cheapest gains and also produce carcasses of highest cutability. Cattlemen should obtain all the carcass information they can get on their cattle to guide them in their breeding and feeding programs.

Unfortunately, until a practical method of marketing cattle according to their true value is available, there is little incentive for cattlemen to improve the carcass merit of their cattle. USDA dual grading is a step in the right direction, but its acceptance by the industry appears doubtful. In the meantime, processors will pay a slight premium for meaty cattle and penalize wasty, low-yielding cattle. However, the spread between them does not reflect their true value as indicated by cutting tests.

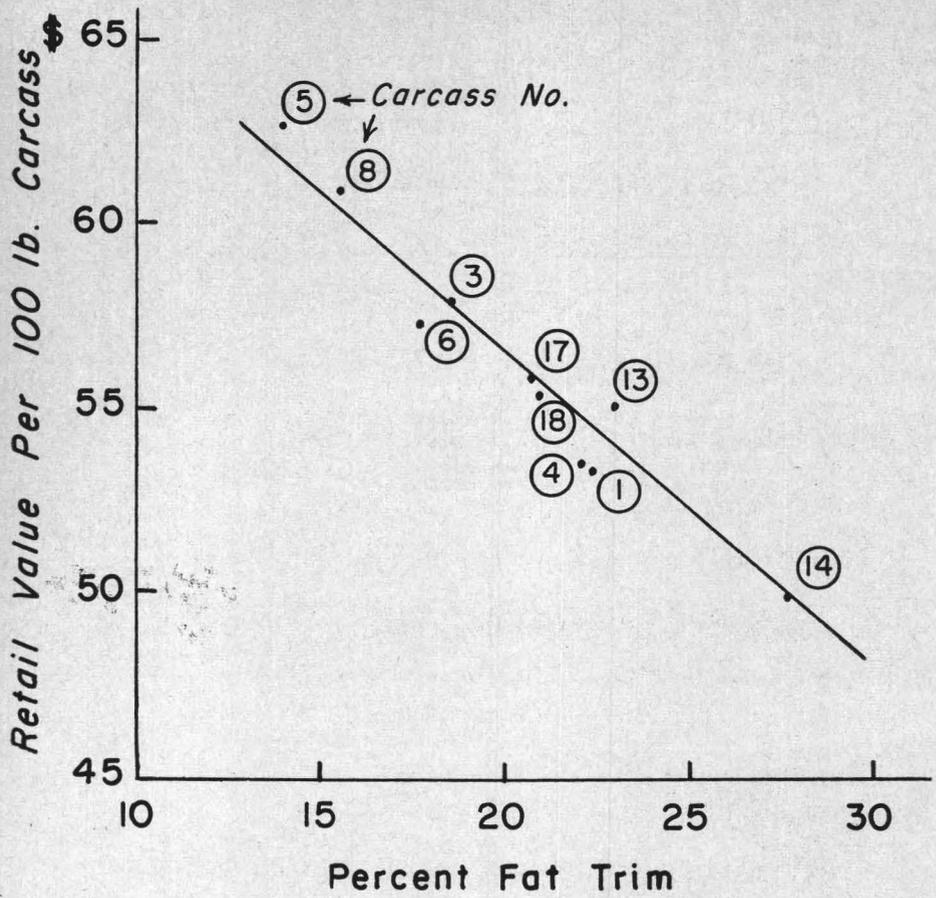
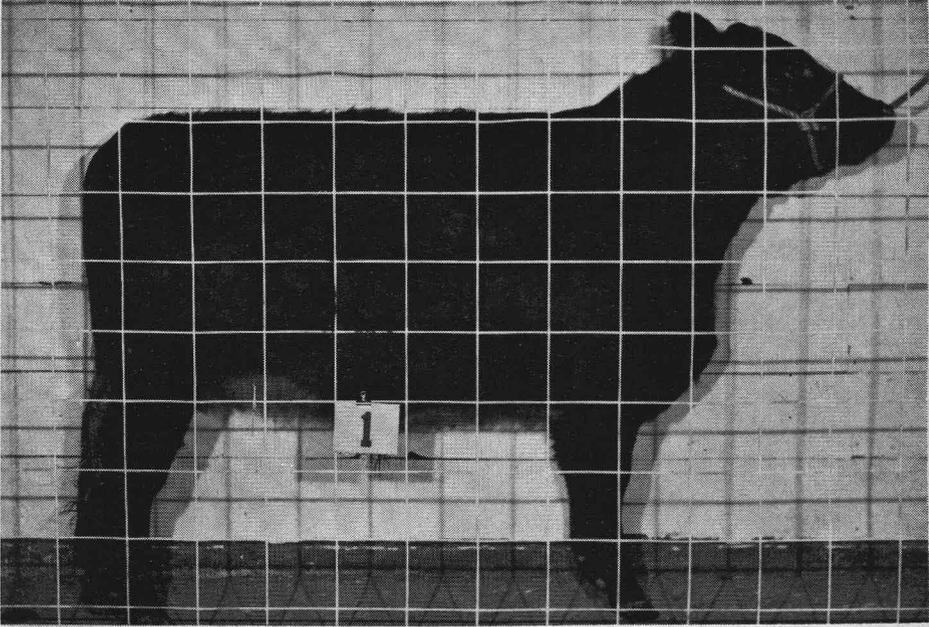


Figure 2. Relation of fat trim to carcass value.

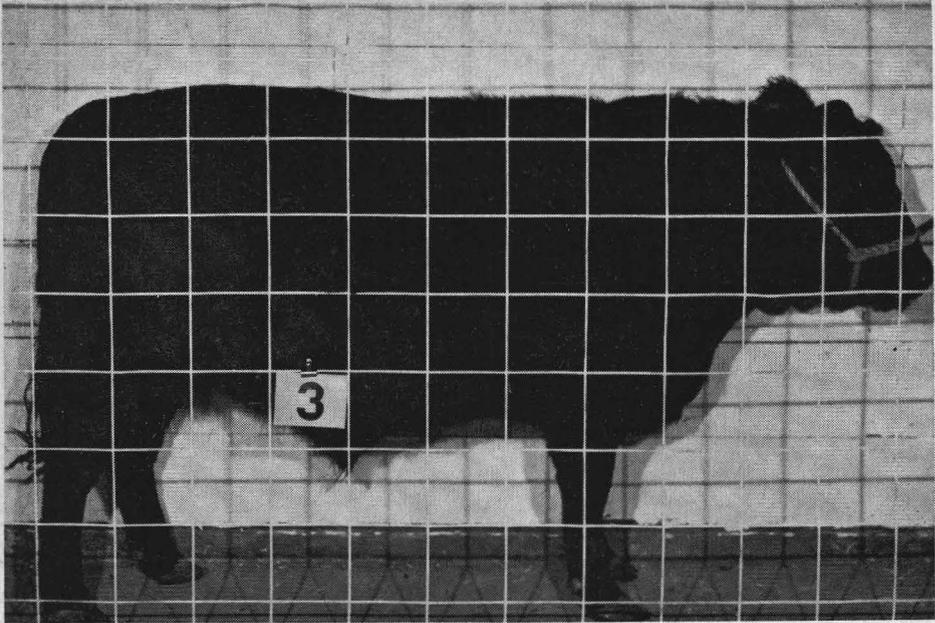
Steer No. 1



No. 1

1. Breed—Shorthorn
2. Live weight—880 lbs.
3. Cold dressed weight—544 lbs.
4. USDA quality grade—Choice-
5. Carcass conformation—Good+
6. Marbling score—Modest+
7. USDA yield grade—3
8. Fat thickness—0.5 inch
9. Rib-eye area/cwt.—2.1 sq. in.
10. % fat trim—22.4
11. % steaks and roasts—38.1
12. % lean trim—24.3
13. Wholesale value/cwt.—\$38.11
14. Retail value/cwt.—\$53.19
15. Live value/cwt.—\$23.56

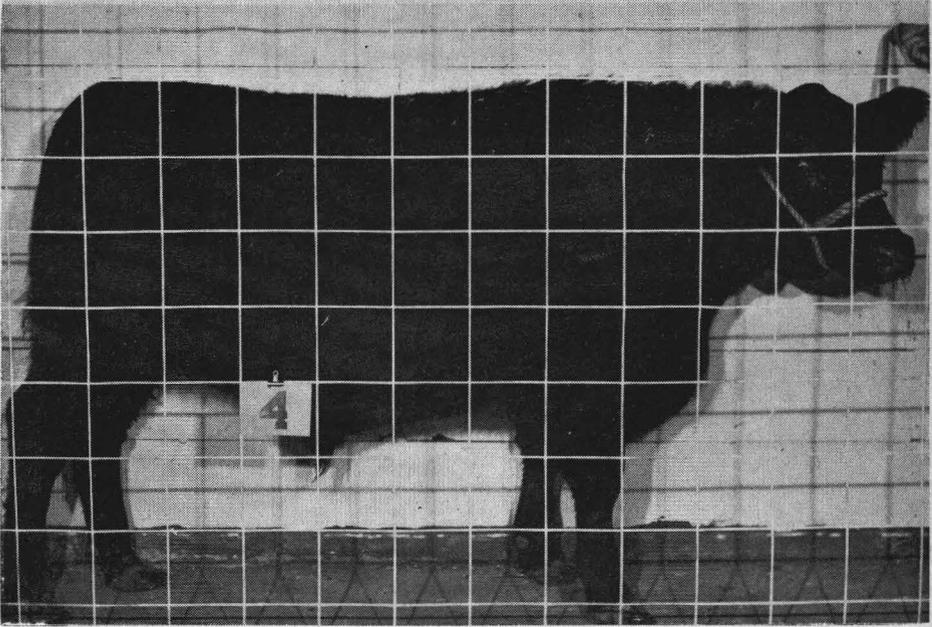
Steer No. 3



No. 3

1. Breed—Angus
2. Live weight—880 lbs.
3. Cold dressed weight—522 lbs.
4. USDA quality grade—Choice
5. Carcass conformation—Choice—
6. Marbling score—Moderate+
7. USDA yield grade—3
8. Fat thickness—0.4 inch
9. Rib-eye area/cwt.—2.16 sq. in.
10. % fat trim—18.5
11. % steaks and roasts—42.8
12. % lean trim—23.8
13. Wholesale value/cwt.—\$42.93
14. Retail value/cwt.—\$57.96
15. Live value/cwt.—\$25.46

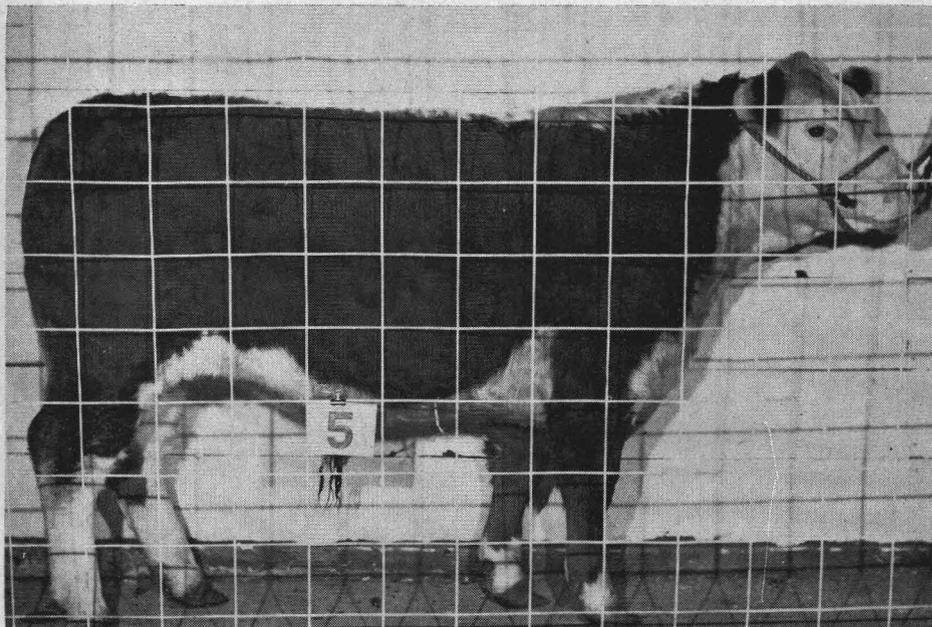
Steer No. 4



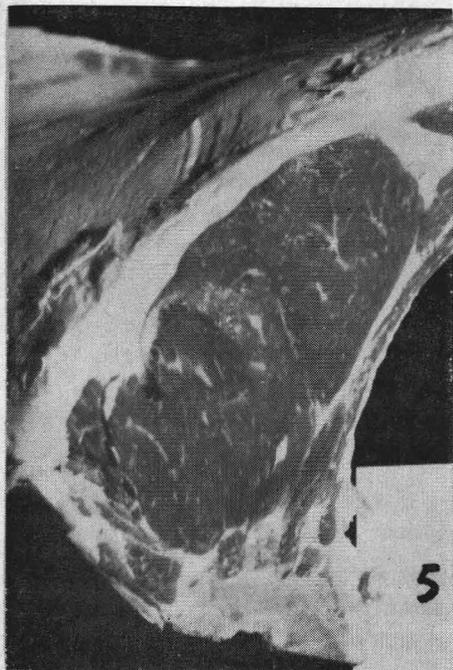
No. 4

1. Breed—Angus
2. Live weight—890 lbs.
3. Cold dressed weight—535 lbs.
4. USDA quality grade—Choice
5. Carcass conformation—Good+
6. Marbling score—S1, abundant
7. USDA yield grade—3
8. Fat thickness 0.7 inch
9. Rib-eye area/cwt.—2.1 sq. in.
10. % fat trim—22.2
11. % steaks and roasts—40.5
12. % lean trim—23.4
13. Wholesale value/cwt.—\$37.99
14. Retail value/cwt.—\$53.57
15. Live value/cwt.—\$22.84

Steer No. 5

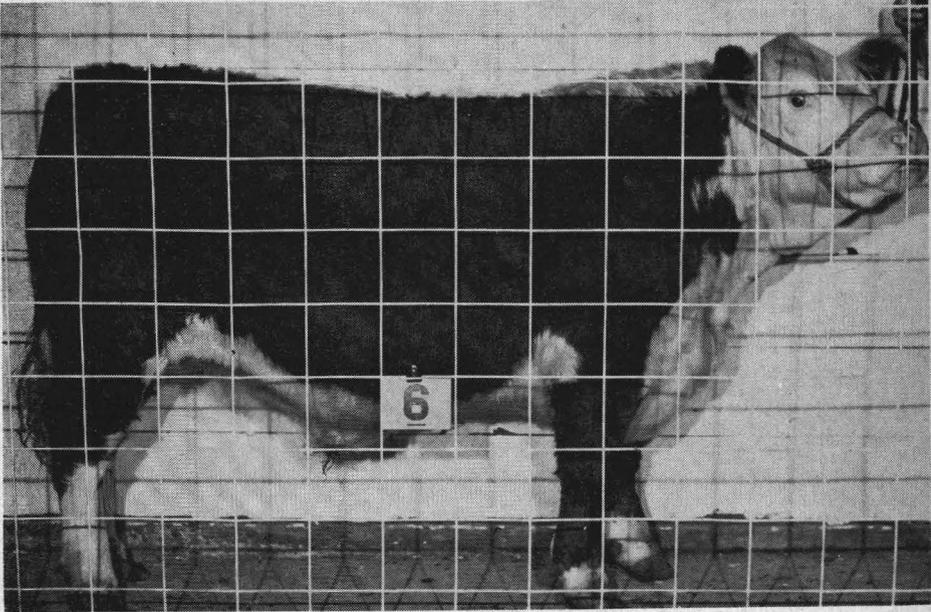


No. 5



1. Breed—Hereford
2. Live weight—910 lbs.
3. Cold dressed weight—546 lbs.
4. USDA quality grade—Choice—
5. Carcass conformation—Choice—
6. Marbling score—Modest—
7. USDA yield grade—2+
8. Fat thickness—0.3 inch
9. Rib-eye area/cwt.—2.72 sq. in.
10. % fat trim—14.0
11. % steaks and roasts—46.9
12. % lean trim—23.1
13. Wholesale value/cwt.—\$47.53
14. Retail value/cwt.—\$62.76
15. Live value/cwt.—\$28.52

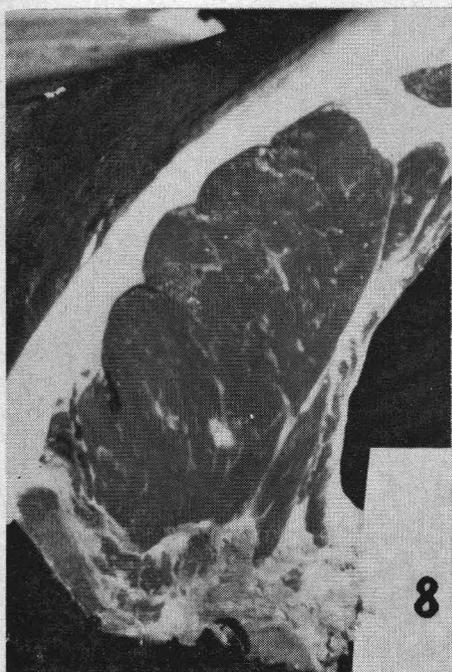
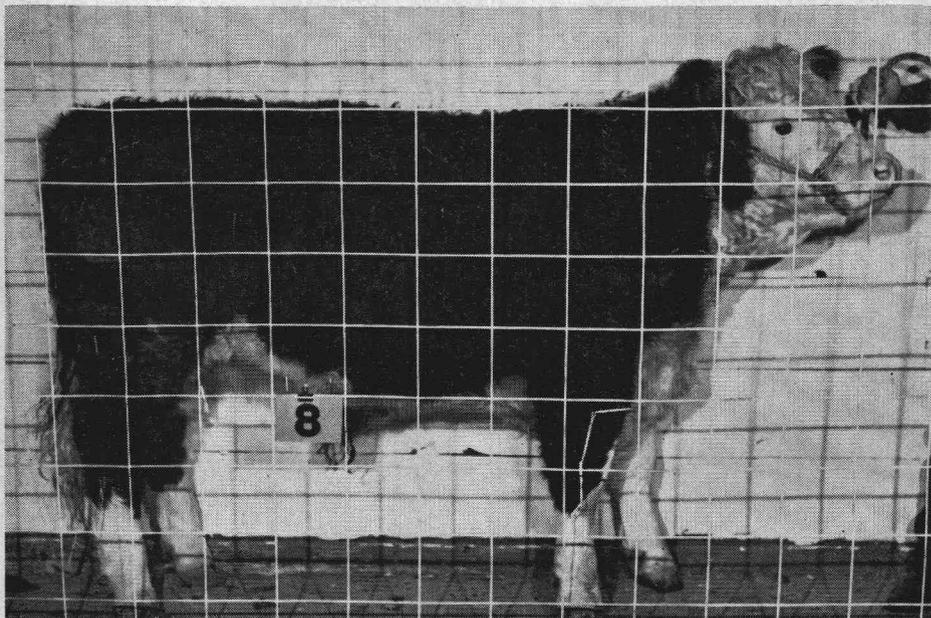
Steer No. 6



No. 6

1. Breed—Hereford
2. Live weight—1,025 lbs.
3. Cold dressed weight—597 lbs.
4. USDA quality grade—Choice—
5. Carcass conformation—Choice—
6. Marbling score—Small+
7. USDA yield grade—3
8. Fat thickness—0.4 inch
9. Rib-eye area/cwt.—2.12 sq. in.
10. % fat trim—17.8
11. % steaks and roasts—42.2
12. % lean trim—24.1
13. Wholesale value/cwt.—\$42.75
14. Retail value/cwt.—\$57.41
15. Live value/cwt.—\$24.90

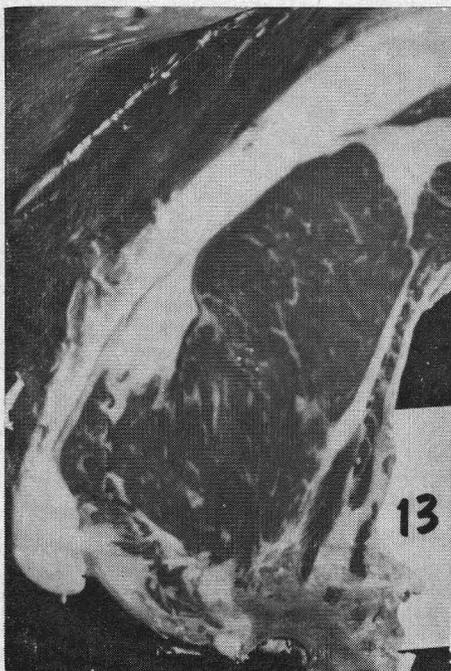
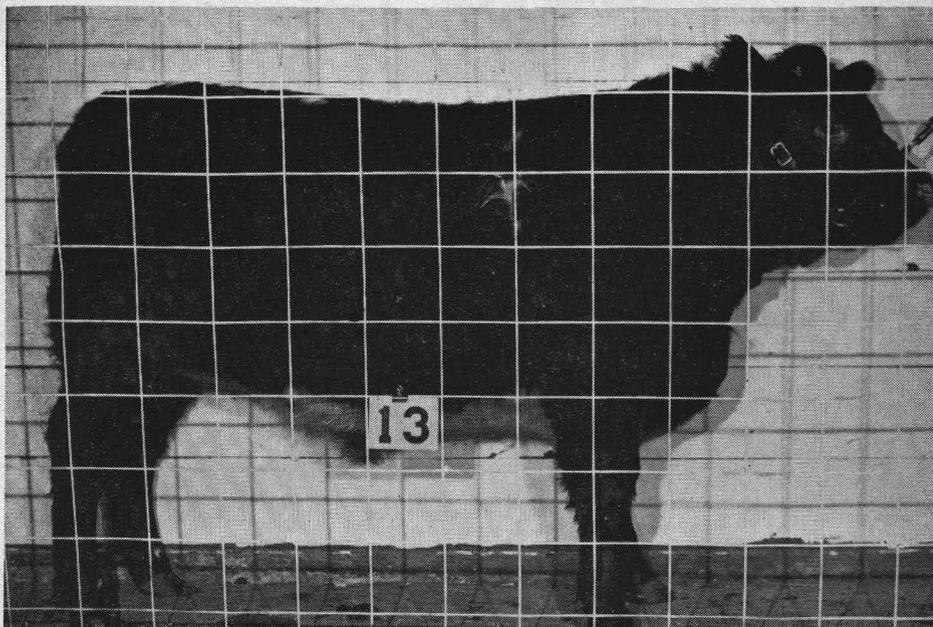
Steer No. 8



No. 8

1. Breed—Hereford
2. Live weight—840 lbs.
3. Cold dressed weight—510 lbs.
4. USDA quality grade—Choice—
5. Carcass conformation—Choice—
6. Marbling score—Slight+
7. USDA yield grade—3
8. Fat thickness—0.4 inch
9. Rib-eye area/cwt.—2.37 sq. in.
10. % fat trim—15.6
11. % steaks and roasts—45.6
12. % lean trim—24.4
13. Wholesale value/cwt.—\$46.13
14. Retail value/cwt.—\$60.80
15. Live value/cwt.—\$28.00

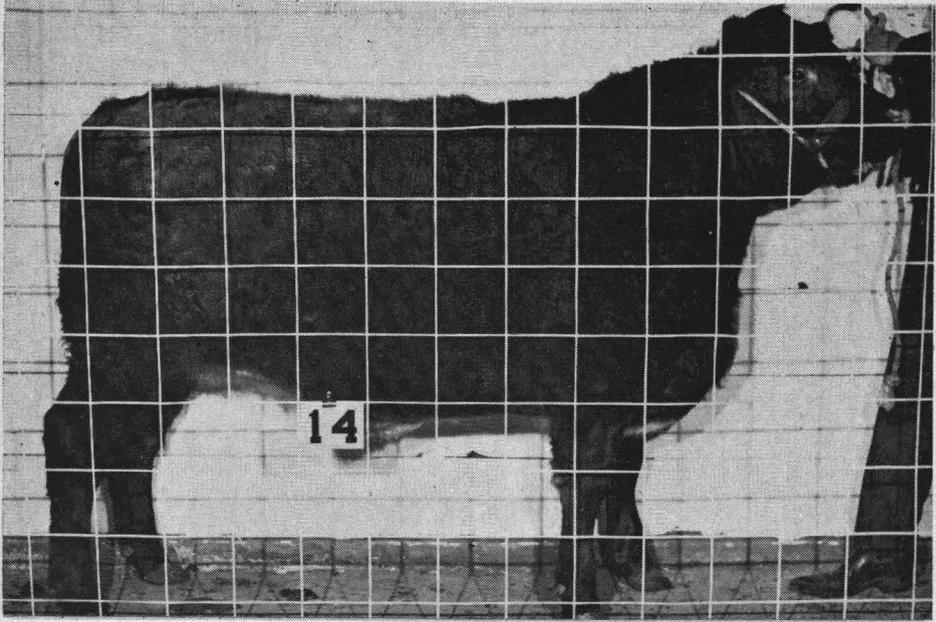
Steer No. 13



No. 13

1. Breed—Shorthorn
2. Live weight—895 lbs.
3. Cold dressed weight—546 lbs.
4. USDA quality grade—Choice+
5. Carcass conformation—Choice-
6. Marbling score—Moderate
7. USDA yield grade—4
8. Fat thickness—0.6 inch
9. Rib-eye area/cwt.—1.97 sq. in.
10. % fat trim—23.1
11. % steaks and roasts—40.6
12. % lean trim—20.0
13. Wholesale value/cwt.—\$40.00
14. Retail value/cwt.—\$55.10
15. Live value/cwt.—\$24.40

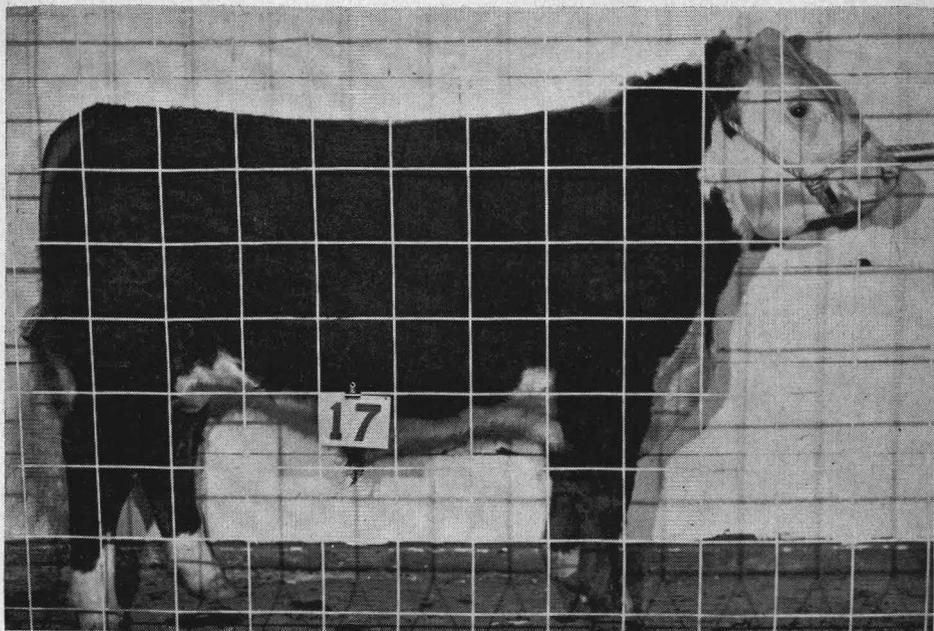
Steer No. 14



No. 14

1. Breed—Shorthorn
2. Live weight—1,090 lbs.
3. Cold dressed weight—694 lbs.
3. USDA quality grade—Choice—
5. Carcass conformation—Choice
6. Marbling score—Moderate—
7. USDA yield grade—5
8. Fat thickness—1.1 inch
9. Rib-eye area/cwt.—1.94 sq. in.
10. % fat trim—27.6
11. % steaks and roasts—35.7
12. % lean trim—21.8
13. Wholesale value/cwt.—\$33.97
14. Retail value/cwt.—\$49.89
15. Live value/cwt.—\$21.63

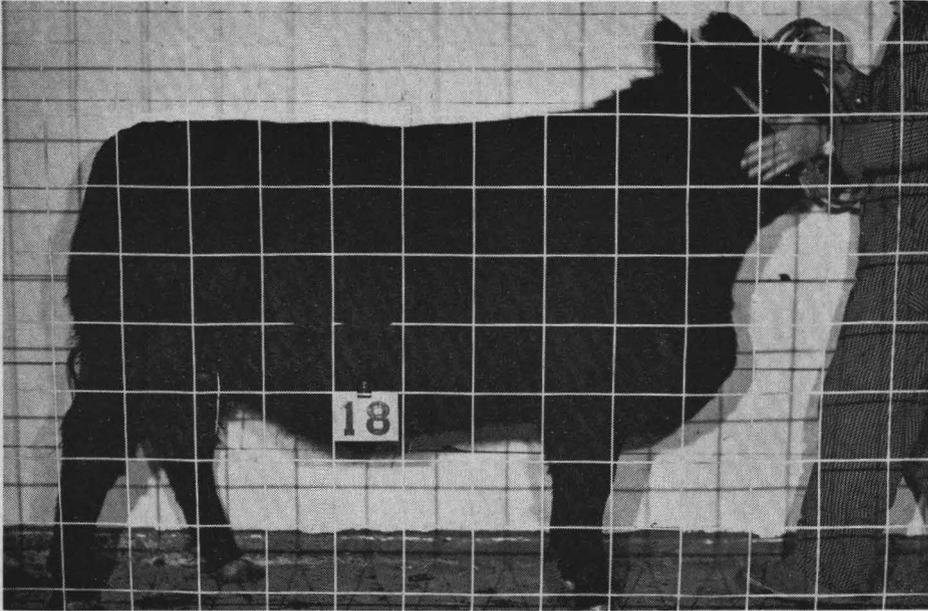
Steer No. 17



No. 17

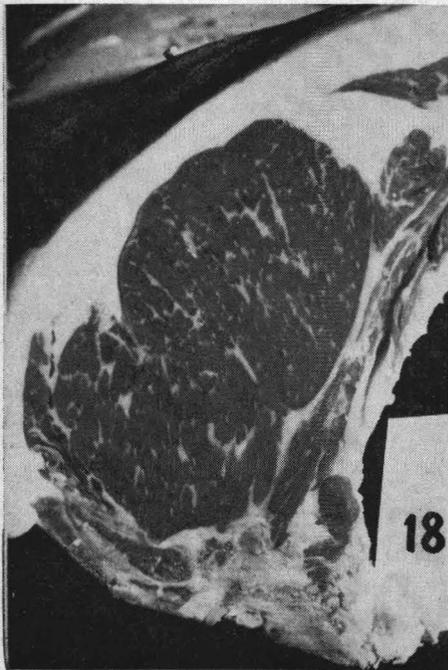
1. Breed—Hereford
2. Live weight—900 lbs.
3. Cold dressed weight—554 lbs.
4. USDA quality grade—Choice+
5. Carcass conformation—Choice
6. Marbling score—Moderate
7. USDA yield grade—3
8. Fat thickness—0.7 inch
9. Rib-eye area/cwt.—2.18 sq. in.
10. % fat trim—20.7
11. % steaks and roasts—42.1
12. % lean trim—20.5
13. Wholesale value/cwt.—\$41.54
14. Retail value/cwt.—\$55.83
15. Live value/cwt.—\$25.57

Steer No. 18



No. 18

1. Breed—Angus
2. Live weight—965 lbs.
3. Cold dressed weight—590 lbs.
4. USDA quality grade—Choice+
5. Carcass conformation—Choice
6. Marbling score—Moderate+
7. USDA yield grade—3+
8. Fat thickness—0.3 inch
9. Rib-eye area/cwt.—2.35 sq. in.
10. % fat trim—21.1
11. % steaks and roasts—40.8
12. % lean trim—22.7
13. Wholesale value/cwt.—\$40.13
14. Retail value/cwt.—\$55.44
15. Live value/cwt.—\$24.53





COOPERATIVE EXTENSION WORK

In Agriculture and Home Economics
State of Oregon

Oregon State University and the U. S.
Department of Agriculture Cooperating

Oregon State University, Corvallis

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The purpose of the Extension Service is to make available to the people of the state the latest information on agriculture and home economics and to help them make use of such information in the improvement of incomes and family living. Extension serves men, women, and—through 4-H club work—boys and girls.

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