

FIVE YEARS OF CANNERY TOMATO INSPECTION IN OHIO

1930-1934

by

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The data upon which this report is based were furnished largely by Mr. M. W. Baker, Supervising Inspector, Federal-State Food Products Inspection Service in Ohio. Other information was secured from the Almanac of the Canning Industry and from records of the United States Bureau of Agricultural Economics.

A study of grading of cannery tomatoes in Ohio, including some experimental work, was made by the Ohio Agricultural Experiment Station in 1931. A report of that study appeared as Bulletin 504, entitled "Marketing Cannery Tomatoes on Grade in Ohio," copies of which are available without charge upon application to the Experiment Station.

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Five Years of Cannery Tomato Inspection in Ohio,
1930-1934

Prior to 1930 all tomato canners operating in Ohio bought raw stock from growers at flat rates per ton, prices being agreed upon in advance of planting. Almost without exception, contracts specified delivery of sound, red-ripe tomatoes, without provision for acceptance of poorer tomatoes under any circumstances. The canner usually reserved the privilege of rejecting deliveries that failed to meet these specifications or of "docking" returns to the grower in proportion to the amount of unacceptable tomatoes delivered, although these terms rarely appeared in contracts. The canner was the final judge of the acceptability of the tomatoes delivered.

In actual practice canners often accepted tomatoes that failed to meet contract requirements. Interpretation of the terms "sound and red-ripe" was not always constant. When the crop was large, it was natural for the buyer to become more critical of the quality and maturity of the tomatoes delivered by growers; whereas, when the yield was small and the canner found it difficult to secure enough tomatoes to meet his requirements, he might overlook inferior deliveries, and often did.

Acceptance of poor tomatoes at one time and insistence on high quality at another tended to destroy confidence, and business relationships suffered. Payment to all growers at the same rate per ton regardless of the quality delivered likewise tended to discourage the better growers and resulted in indifferent harvesting and handling. The growers' principal objective became large tonnage, without regard to quality or maturity beyond the minimum of acceptability to the buyer. Canners constantly faced a difficult task in attempting to maintain quality.

United States grades for cannery tomatoes were used on a commercial scale by Ohio canners for the first time in 1930. In that year these standards were adopted by five canners in this State as the basis for contracts with their growers. The grade of each load was determined by government inspection at time of delivery at the seven factories and receiving stations operated by these five manufacturers. Returns to growers were based on the proportionate amounts of each grade in the samples examined by the inspectors, 50 per cent to 80 per cent more being paid for U.S. No.1 grade than for U.S. No.2 grade. No payment was made for tomatoes failing to meet the specifications of either of these two grades.

Inspection was provided by joint action of the United States Bureau of Agricultural Economics and the Ohio Division of Markets. The inspectors were employed, trained and supervised by the Federal-State Food Products Inspection Service and were stationed at receiving stations where and when needed. During the period of their employment the manufacturers using the service paid to the State Department of Agriculture an amount sufficient to cover the salaries and expenses of the inspectors, who were in turn paid by that Department from the fund so collected.

Volume Bought on Grade

In the five years since adoption of federal grades and inspection by the five companies who pioneered in this movement in Ohio, this buying practice not only has been continued by these companies but has been adopted by almost all tomato canners in this state until in 1934 it was employed at 19 factories, operated by 16 companies. The amount of tomatoes so purchased rose from 9100 tons in 1930 to 28,000 tons in 1934, or more than three times the volume bought on grade the first year.

Table 1 - Manufacturers Using Cannery Tomato Grades in Ohio, 1930-1934

Year	No. of Companies	No. of Receiving Stations	Tomatoes Purchased (tons)
1930	5	7	9098.38
1931	12	14	18088.022
1932	15	17	23635.702
1933	15	18	26627.652
1934	16	19	28170.833

The 19 factories where tomatoes were received on grade in 1934 are located as follows: Blissfield, Bloomdale, Celina, De Graff, Glen Karn, Greenville, Mendon, Minster, Oak Harbor, Ohio City, Osgood, Port Clinton, Rockford, St. Henry, St. Marys, Tippecanoe City, Urbana, Van Wert and Wapakoneta. All but Blissfield are in Ohio. The factory in Blissfield is just outside of Ohio in Michigan, but since there is no provision for cannery tomato inspection in that state the company operating that factory employed the inspection service offered by the Ohio Department of Agriculture in conjunction with the U.S. Bureau of Agricultural Economics. Location of the factories is shown in Figure 1.

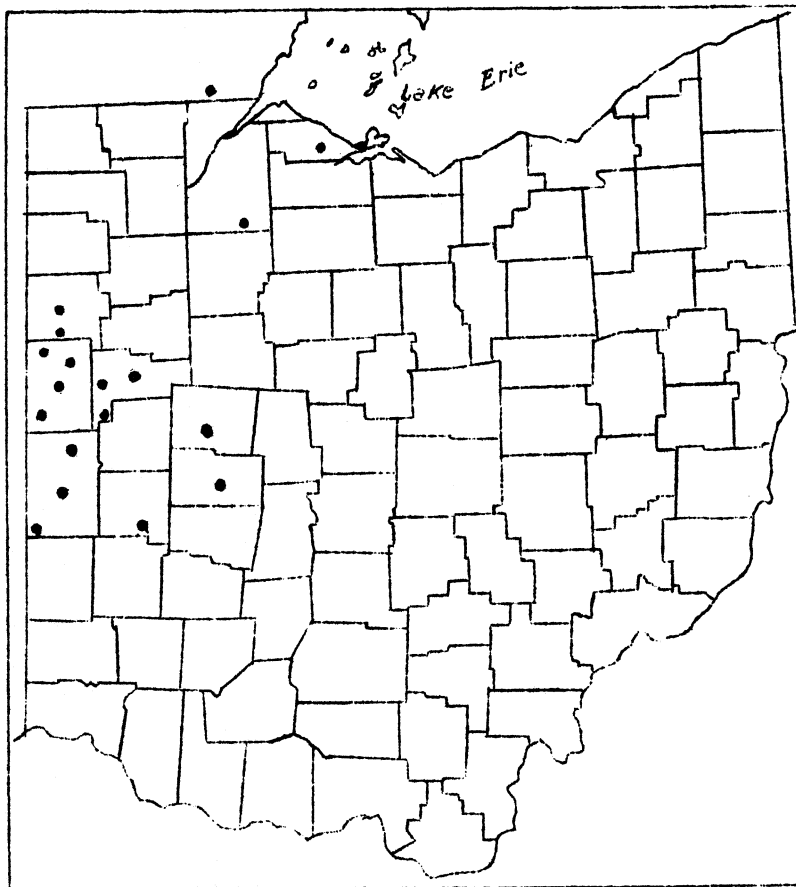


Figure 1 - Factories Using Cannery Tomato Inspection
1934

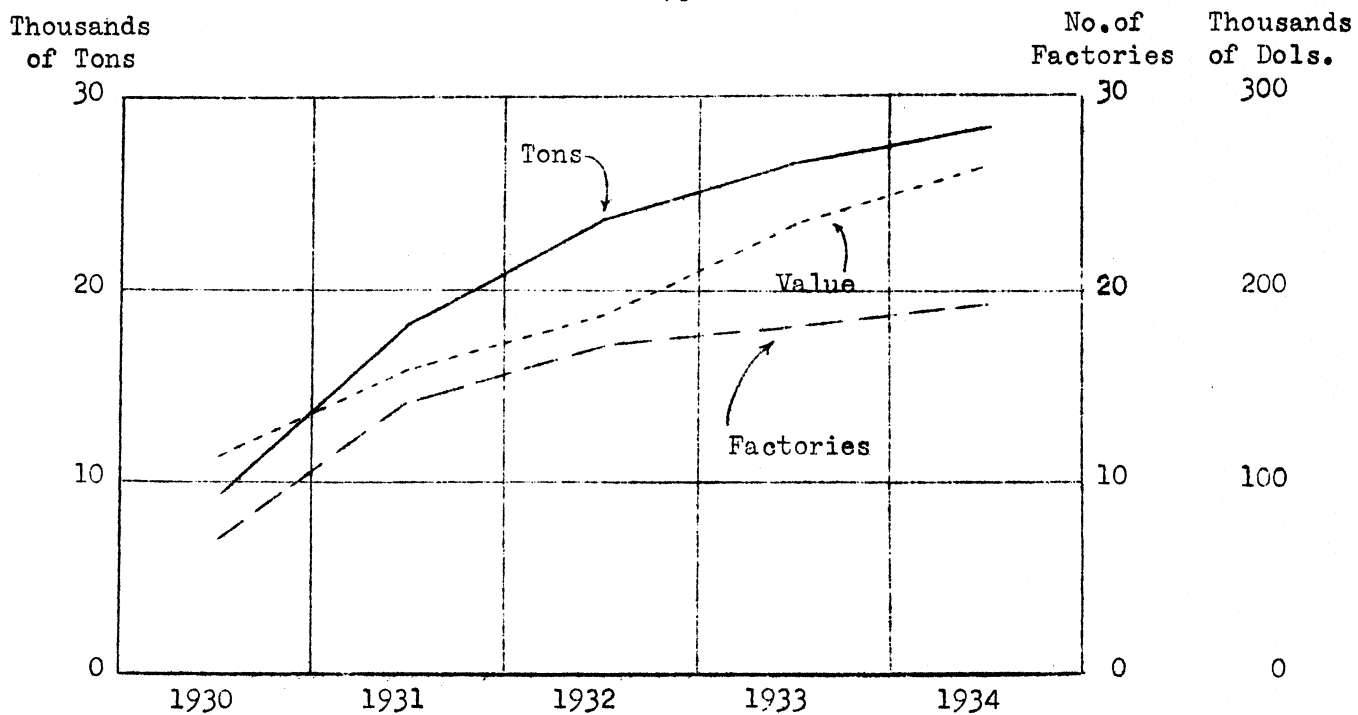


Figure 2 - Tomatoes Bought on Grade by Ohio Canneries
1930-1934

In five years federal grades and inspection have been used at 26 factories and receiving stations in Ohio, but not all of these have operated continuously. Identification numbers used in Tables 2, 4 and 6 are identical, the same number referring to the same factory throughout.

In 1934 the 19 factories where tomatoes were bought on grade used amounts varying from 256 tons to 5056 tons, and thus typified a wide variety of conditions.

Table 2 - Tomatoes Bought on Grade by Ohio Cannerys,
1930-1934

Factory	1930 (tons)	1931 (tons)	1932 (tons)	1933 (tons)	1934 (tons)
1	358.4	211.7	170.1	334.9	256.4
2	427.4				
3	211.8				
4	1396.0	1882.1	1776.1	1885.0	2641.9
5	1339.5	605.3	617.1	816.2	928.3
6	2165.5	1367.0	889.3	704.2	548.9
7	3200.0	2013.1	777.8	1346.0	989.1
8		3605.2	3577.1	4079.3	4579.6
9		1915.4	1997.5	2142.5	783.0
10		1907.6	1477.5	1692.6	1027.7
11		1756.2	1967.4	1974.3	1431.9
12		1384.1	1256.2	1326.2	1092.2
13		867.1	565.9	994.0	519.8
14		314.2	547.4	536.2	689.9
15		143.2			
16		115.8	154.3	230.2	
17			4700.5	3216.8	5056.4
18			2819.5	3982.9	3223.3
19			315.5	204.2	
20			26.5		
21				973.6	299.1
22				188.5	
23					270.6
24					449.5
25					1960.7
26					1422.6
Total	9098.4	18088.0	23635.7	26627.6	28170.9

Prices and Values

During the 5 year period under consideration prices to growers have not been uniform. An abrupt decline in prices per ton occurred from 1930 to 1932, followed by a small increase during the next two years, but owing to the steadily increasing volume bought on grade the total value to growers has increased constantly throughout this period.

Table 3 - Prices and Values of Tomatoes Bought on Grade
by Ohio Cannerys, 1930-1934

Year	Weighted Average Price per Ton (dollars)	(index; 1930=100)	Total Value to Growers (dollars)
1930	12.27	100	111,672.42
1931	9.34	76	169,071.84
1932	7.83	64	185,136.73
1933	8.73	71	232,582.54
1934	9.27	75	261,685.04

Not only have prices lacked uniformity from year to year, but wide variations have existed among prices paid at different factories. In 1930, for example, prices for U.S. No.1 tomatoes varied from \$14. to \$18. a ton, and for U.S. No.2 tomatoes from \$8. to \$12. a ton. In 1934, after four years of experience with this method of buying, variations in prices at different factories varied about as widely as in 1930, or from \$10. to \$14. for No.1's and from \$5. to \$7.75 for No.2's. The relationship between the price for No.1 tomatoes and the price for No.2 tomatoes showed some slight tendency to become fixed or constant, (see columns headed "Price Ratio" in Table 3), but in 1934 was still variable.

In 1930, all manufacturers in Ohio using federal grades paid more than 50 per cent of their U.S. No.1 price for No.2 tomatoes. In 1931, 4 paid 50 per cent, with 8 paying more and 2 less. In 1932, 6 paid 50 per cent, with 4 paying more and 7 less. In 1933, 12 paid 50 per cent, with 4 paying more and 2 less. In 1934, 13 paid 50 per cent, with 4 paying more and 2 less. Apparently most of these cannerys considered U.S. No.2 tomatoes worth about one-half as much as U.S. No.1 tomatoes.

Local factors, not the least of which are competitive conditions, doubtless influence considerably not only the level of prices paid to farmers but also the ratio between prices for the two grades. Note that at Factories No.4 and 6 changes have been made every year for 5 years.

Table 4 - Prices Paid to Growers for Graded Tomatoes by Ohio Cannerys
1930-1934

Factory	1930 /1			1931 /1			1932 /1			1933 /1			1934 /1		
	No.1 (dols.per ton)	No.2 (dols.per ton)	Price Ratio	No.1 (dols.per ton)	No.2 (dols.per ton)	Price Ratio	No.1 (dols.per ton)	No.2 (dols.per ton)	Price Ratio	No.1 (dols.per ton)	No.2 (dols.per ton)	Price Ratio	No.1 (dols.per ton)	No.2 (dols.per ton)	Price Ratio
1	18	12	67	12	10	83	10	5	50	9	4.50	50	12	6	50
2	18	12	67												
3	14	8	57												
4	14	8	57	13	6	46	10	5	50	10.50	5.50	52	10.25	6.25	61
5	18	10	55	15	8	53	10	6	60	12.50	6.25	50	12	6	50
6	16	9	56	12	8	67	10	6	60	10	6.88	69	10.25	7.75	76
7	16	9	56	14	7	50	11	6	54	15	7.50	50	12	6	50
8				11	11	100	10	5	50	10	5	50	11.25	6.25	55
9				13	7	54	11	5	45	11.25	5.62 $\frac{1}{2}$	50	11.25	5.62 $\frac{1}{2}$	50
10				14	6	43	10	5	50	11.25	5.62 $\frac{1}{2}$	50	11.25	5.26 $\frac{1}{2}$	50
11				13	7	54	11	5	45	11.25	5.62 $\frac{1}{2}$	50	11.25	5.62 $\frac{1}{2}$	50
12				14	7	50	10	5	50	11.25	5.62 $\frac{1}{2}$	50	11.25	5.62 $\frac{1}{2}$	50
13				13	7	54	11	5	45	11.25	5.62 $\frac{1}{2}$	50	11.25	5.62 $\frac{1}{2}$	50
14				14	7	50	11	5	45	13.75	6.25	45	12	6	50
15				14	7	50									
16				15	12	80	10	5	50	10	5	50			
17							11	5	45	12	6	50	12.50	6	48
18							9	4	44	11.25	5	44	10	5	50
19							16	9	56	14.75	9.75	66			
20							11	5	45						
21										15	7.50	50	12	6	50
22										10.50	5.50	52			
23													11.25	5.62 $\frac{1}{2}$	50
24													14	6	43
25													11	6	54
26													12	6	50

¹ Price of U.S. No. 2 tomatoes expressed in terms of per cent of price of U.S. No.1 tomatoes.

During these five years the prices of canned tomatoes fluctuated about as widely as contract prices of raw tomatoes in Ohio, but made a greater recovery in the last half of 1933 and in 1934 than did the prices to growers. Whereas spot prices of No.3 Standard Tomatoes in 1934 stood at 90 per cent of the 1930 level, prices to Ohio growers were only 75 per cent as high as in 1930.

Table 5 - Spot Prices of Standard Tomatoes f.o.b. County,
Jan. 1930-July 1934
(Almanac of the Canning Industry.)

Date	Dollars per dozen No.3 cans	Index Av. Jan and July, 1930=100
Jan., 1930	1.35	97
July, 1930	1.42½	103
Jan., 1931	1.05	76
July, 1931	.95	68
Jan., 1932	1.00	72
July, 1932	1.15	83
Jan., 1933	.85	61
July, 1933	1.30	94
Jan., 1934	1.25	90
July, 1934	1.25	90

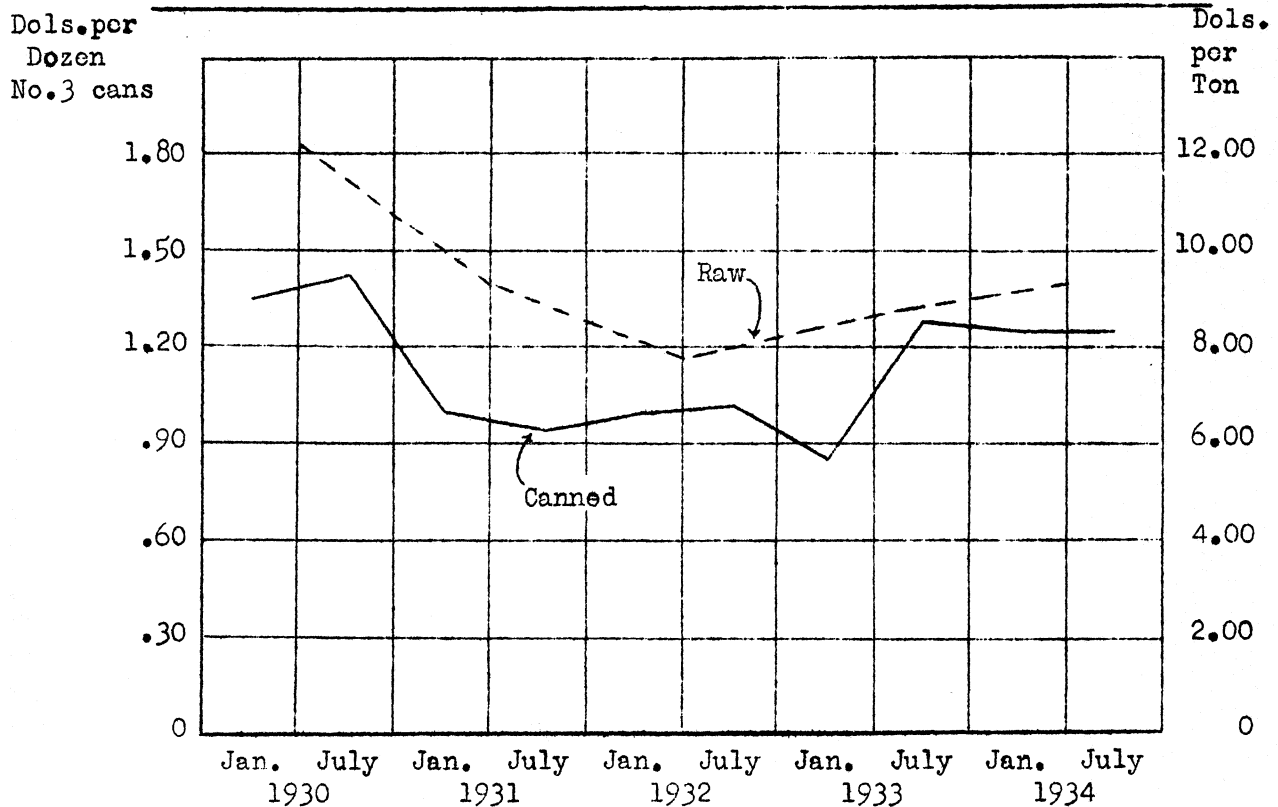


Figure 3 - Prices of Raw and Canned Tomatoes
at Ohio Factories
1930-1934

Quality

An almost constant improvement in quality of tomatoes delivered has accompanied the use of grades in Ohio. Owing to especially unfavorable growing conditions in the state in 1931 the quality that year declined slightly below that of 1930 but in each year since 1931 a progressive gain has been made in the proportions of U.S. No.1 tomatoes received at the factories where federal grades and inspection were employed. The percentage of culls delivered in 1934 was smaller than in any other of the five years under consideration.

Grade specifications* and interpretations have remained unchanged throughout this period. Training and supervision of the inspectors have been under the direction of the same individual. Obviously, therefore, the increased percentages of No.1 tomatoes reported represent an actual rather than fictitious improvement in quality, and are due to better understanding of grade requirements and better picking and handling practices by growers.

Opportunities still exist for improving quality. At certain factories the grade record is much better than at others, the difference between the best and the poorest being so great as not to be accounted for wholly by differences in growing conditions. In 1934 the receipts at four factories exceeded 70 per cent U.S. No.1's, and at one of these No.1 tomatoes actually reached almost 77 per cent. Culls at these four factories were only 2.7, 4.5, 5.0, and 5.4 per cent respectively. At the other extreme were two factories where No.1 tomatoes amounted to only 56 and 58 per cent respectively of the total, and culls were 6.4 and 8.5 per cent. It will be noted that the manufacturer with the highest percentage of U.S. No.1 tomatoes in 1934 has been buying on grades and inspection only three years, and that his percentage of No.1's have risen steadily in that period from 65.4 per cent to 76.7 per cent.

* "U.S. Standards for Cannery Tomatoes" in use during this period were promulgated by the U.S. Department of Agriculture in 1926. "U.S. Standards for Tomatoes for Manufacture of Strained Tomato Products" were promulgated in 1933, but were not used commercially in Ohio during this period. Copies of both standards appear following page 11.

Table 6 - Percentage Distribution of Grades of Cannery Tomatoes at Ohio Factories, 1930-1934

Factory	1930			1931			1932			1933			1934		
	No.1	No.2	Culls	No.1	No.2	Culls	No.1	No.2	Culls	No.1	No.2	Culls	No.1	No.2	Culls
1	56.1	33.1	10.8	49.3	30.5	20.2	43.6	43.6	12.8	60.7	27.6	11.7	57.9	33.6	8.5
2	52.5	28.0	9.5												
3	68.4	24.6	7.0												
4	70.9	24.9	4.2	63.8	25.0	11.2	72.6	15.3	12.1	64.3	26.1	9.6	68.2	25.1	6.7
5	45.2	50.4	4.4	48.2	32.2	19.6	53.8	33.6	12.6	66.6	26.8	6.6	67.5	22.9	9.6
6	51.4	40.5	8.1	46.6	39.5	13.8	45.0	38.3	16.7	55.0	34.0	11.0	63.9	28.6	7.5
7	49.9	43.1	7.0	32.2	49.4	18.4	50.5	38.5	11.0	45.5	38.8	15.7	68.8	19.5	11.7
8				57.7	35.6	7.7	76.7	14.1	9.2	69.0	23.9	7.1	70.4	24.2	5.4
9				50.7	39.0	10.3	59.3	32.9	7.8	62.3	32.0	5.7	65.1	28.9	6.0
10				45.1	42.8	12.1	50.0	39.9	10.1	65.1	29.0	5.9	63.7	26.3	10.0
11				60.2	24.4	15.4	58.1	31.9	10.0	59.3	34.4	6.3	56.1	37.5	6.4
12				49.8	38.8	11.4	44.2	47.7	8.1	59.8	30.3	9.9	68.7	23.2	8.1
13				58.2	23.5	18.3	44.8	44.1	11.1	55.8	35.3	8.9	64.5	29.4	6.1
14				62.1	27.8	10.1	61.4	29.0	9.6	56.6	28.5	14.9	66.6	29.5	3.9
15				44.3	41.2	14.5									
16				45.9	43.7	10.4	58.6	32.6	8.8	58.5	34.2	7.3			
17							65.4	31.3	3.3	67.6	24.7	7.7	76.7	20.6	2.7
18							48.8	43.7	7.5	64.7	18.6	16.7	64.7	27.4	7.9
19							65.5	20.4	14.1	56.6	33.9	9.5			
20							38.8	37.1	24.1						
21										51.0	39.5	9.5	70.8	24.2	5.0
22										48.0	40.8	11.2			
23													65.0	25.4	9.6
24													62.6	25.6	11.8
25													70.7	24.8	4.5
26													67.5	26.8	5.7
Average	54.3	38.9	6.8	51.7	35.6	12.7	60.1	31.4	8.5	62.6	28.0	9.4	68.6	25.3	6.1

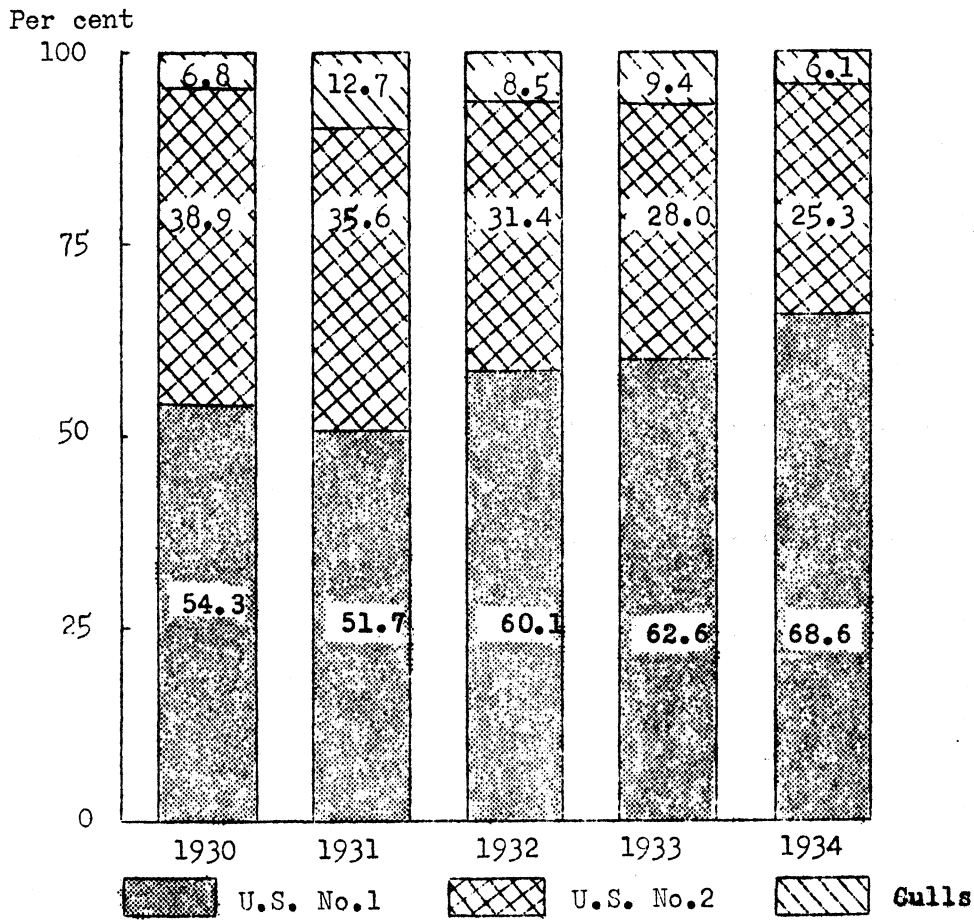


Figure 4 - Cannery Tomato Inspection, Distribution of Grades at Ohio Factories, 1930-1934

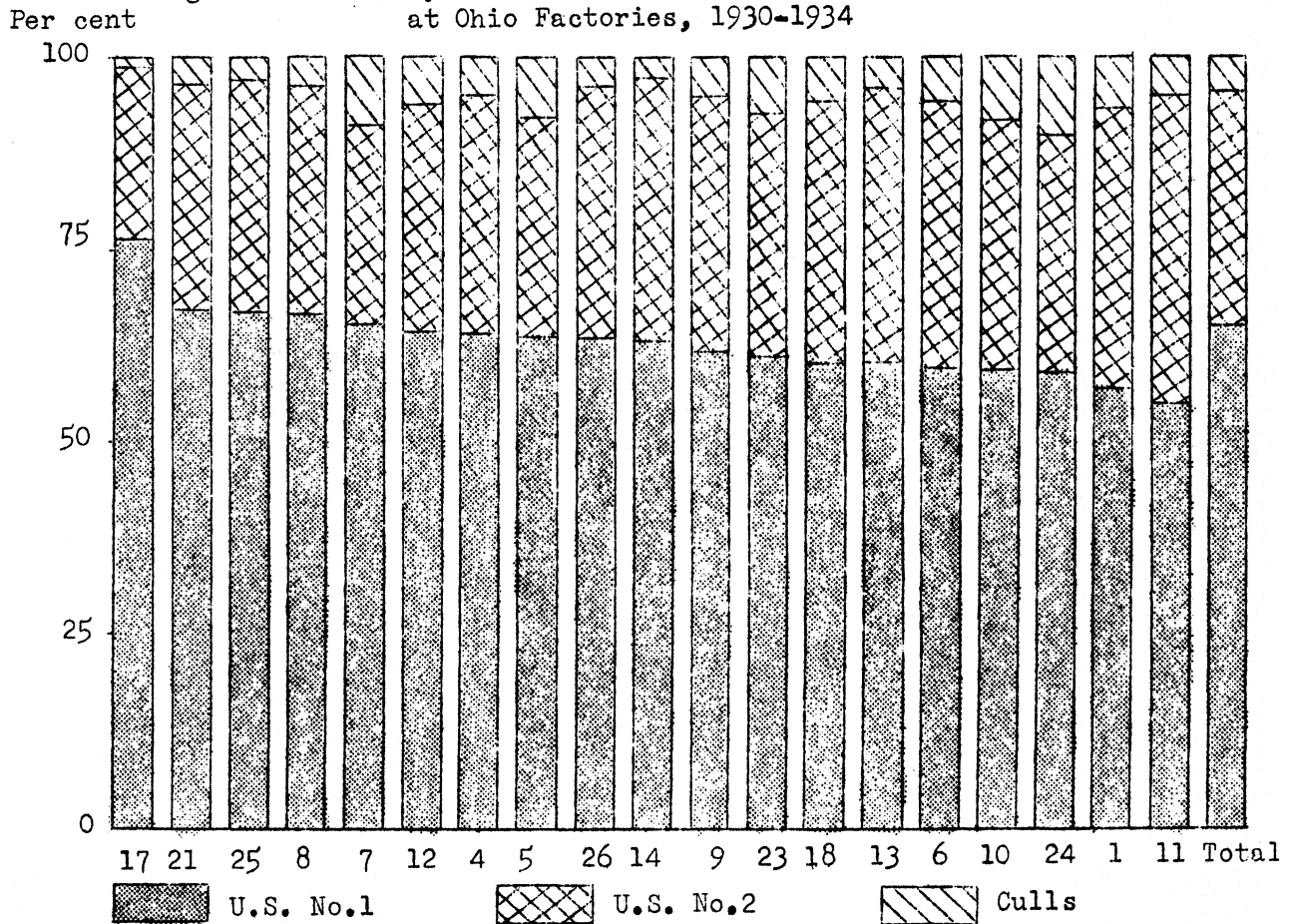


Figure 5 - Cannery Tomato Inspection Distribution of Grades at 19 Ohio Factories, 1934

Detailed records of quantities and grades delivered daily at three representative Ohio factories in 1934 have been analyzed to show quality fluctuations throughout the season. The composite records, covering the period from August 15 to October 22 inclusive, include 3926 tons of tomatoes, of which 66.3 per cent were U.S. No.1, 26.0 per cent were U.S. No.2 and 7.7 per cent were culls. The records were taken at Factories No. 4, 5, and 10. It will be noted that quality declined materially at the close of the season.

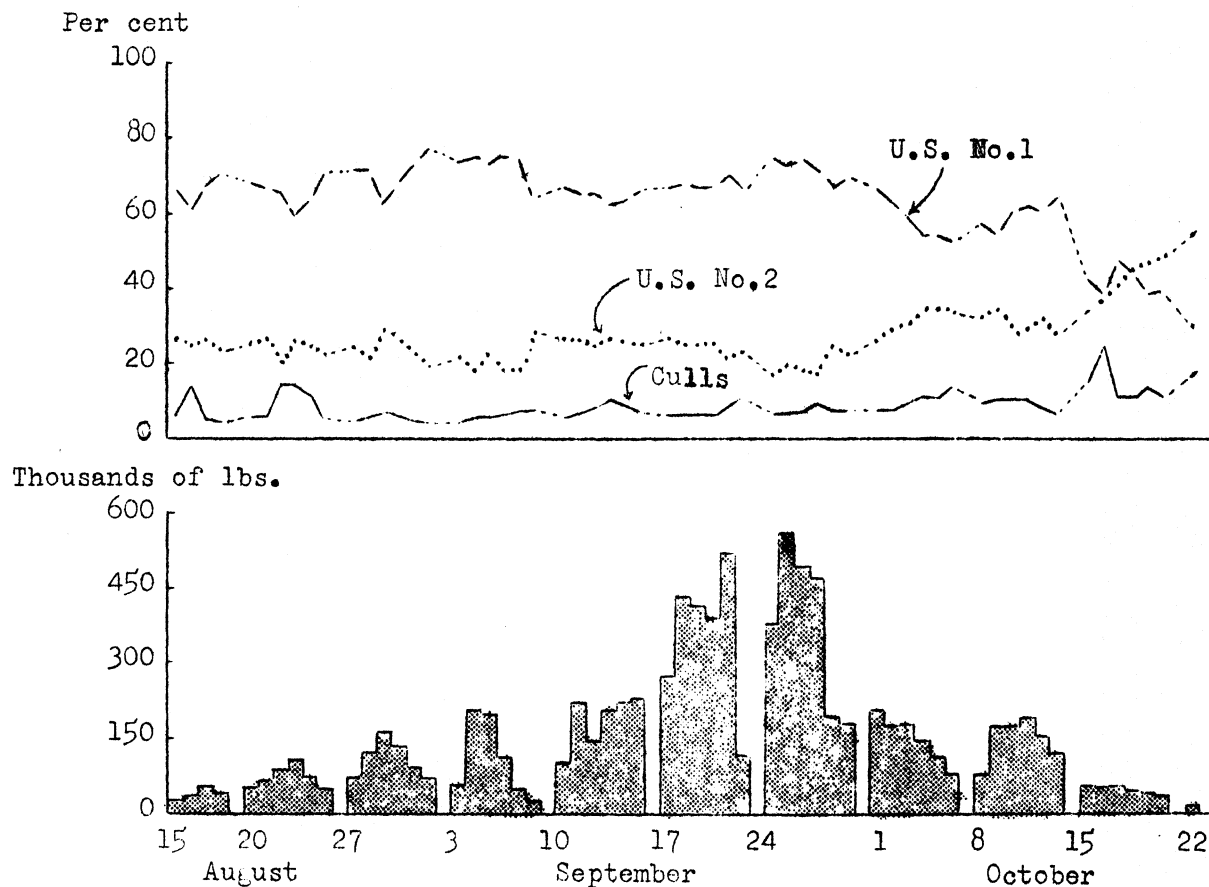


Figure 6 - Cannery Tomato Inspection
 Daily Distribution of Grades at 3 Typical Ohio Factories Combined
 1934

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS

U.S. STANDARDS FOR CANNERY TOMATOES (1926)

Grades for canning tomatoes which will provide a definite basis for contracts between the canner and the grower are meeting with increasing favor. Such grades must recognize variations in commercial value and still be simple enough to be practical in actual operations.

In recommending the attached U.S. Grades, the U.S. Department of Agriculture has attempted to formulate the views of leading representatives of both growers and canners and careful studies of present practices show them to be practical. However, as the idea of grading tomatoes for cannery purposes is new, a further word of explanation seems desirable.

It should be understood at the outset that the only grading required of the grower is the removal of Culls. Such tomatoes should be left in the field. It is not intended that the grower sort the tomatoes into No.1 and No.2 grades. The proposed grades provide a basis for sampling the tomatoes as they are delivered to the cannery.

The application of these grades requires the services of private or official inspectors to determine the amounts of each grade in the various loads of tomatoes. Such inspectors must be capable, efficient, and above all, they must be absolutely neutral. The inspectors reports should show the percentages of U.S. No.1, U.S. No.2, and Cull tomatoes.

Buying and selling on grade will encourage better production and better handling. The present practice of paying a flat price for everything which is accepted, discriminates against the best growers. The grower should be paid a suitable premium for stock of high quality which will make a high quality manufactured product. Such stock can be canned at a minimum cost. On the other hand, there should be suitable penalties for the delivery of culls.

March 1, 1926

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS

U.S. STANDARDS FOR CANNING TOMATOES (1926)

GRADES

U.S. No.1 shall consist of tomatoes which are firm, ripe, well colored, well formed; free from molds and decay and from damage caused by growth cracks, worm holes, catfaces, sunscald, freezing injury, or mechanical or other means. (See minimum size.)

U.S. No.2 shall consist of tomatoes which do not meet the requirements of the foregoing grade, but which are ripe and fairly well colored and which are free from serious damage from any cause. (See minimum size.)

Culls are tomatoes which do not meet the requirements of either of the foregoing grades.

MINIMUM SIZE

The minimum size may be fixed by agreement between buyer and seller. Tomatoes below this specified minimum size shall be classed as Culls.

DEFINITIONS OF TERMS

As used in these grades:

"Firm" means that the tomato is not soft, puffy, shriveled or water soaked.

"Well colored" means that the tomato shows at least 90 per cent good red color.

"Fairly well colored" means that the tomato shows at least two-thirds good red color.

"Well formed" means that the tomato shall not be extremely flat or otherwise badly misshapen.

"Damage" means any injury which cannot be removed in the ordinary process of trimming and peeling without a loss of more than 10 per cent (by weight) of the tomato in excess of that which would occur if the tomato were perfect.

"Serious damage" means any injury which cannot be removed in the ordinary process of trimming and peeling without a loss of more than 20 per cent (by weight) of the tomato in excess of that which would occur if the tomato were perfect.

March 1, 1926

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS

U. S. STANDARDS FOR TOMATOES FOR MANUFACTURE OF
STRAINED TOMATO PRODUCTS

GRADES

U.S. No.1 shall consist of tomatoes which are fairly firm, ripe well colored, and free from stems and from damage caused by badly discolored cracks, shriveling, molds, decay, sunburn, sunscald, freezing or other means.

U.S. No.2 shall consist of tomatoes which do not meet the requirements of the foregoing grade but which are ripe and fairly well colored and which are free from serious damage from any cause.

Culls are tomatoes which do not meet the requirements of either of the foregoing grades.

DEFINITIONS OF TERMS

As used in these grades:

"Fairly firm" means that the tomato is not water soaked.

"Well colored" means that at least 90 per cent of the flesh of the tomato has good red color, provided that a tomato having flesh of a lighter shade of red shall be considered as "well colored" if enough additional area of the flesh has a shade of red color so that the tomato has a sufficient amount of red to be equivalent in color to that of a tomato which has 90 per cent good red color.

"Fairly well colored" means that at least two-thirds of the flesh of the tomato has good red color, provided that a tomato having flesh of a lighter shade of red shall be considered as "fairly well colored" if enough additional area of the flesh has a shade of red color so that the tomato has a sufficient amount of red to be equivalent in color to that of a tomato which has two-thirds good red color.

"Damage" means any injury which appreciably affects the quality of the tomato for pulping. Any one of the following defects or any combination of defects which exceeds the maximum allowed for any one defect shall be considered as damage:

- (a) Molds or decay, except that molds or very slight decay which can be removed in the ordinary process of washing without hand trimming shall not be considered as damage.
- (b) Sunburn or sunscald which cannot be removed in the ordinary process of trimming without a loss of more than 10 per cent, by weight, of the tomato in excess of that which would occur if the tomato were perfect.
- (c) Tomatoes which show an appreciable amount of shriveling.

"Serious damage" means any injury which severely affects the quality of the tomato for pulping. Any one of the following defects or any combination of defects which exceeds the maximum allowed for any one defect shall be considered as serious damage:

- (a) Decay which has caused the tomato to become sour, or decay or disease, such as Anthracnose spots, Blossom-end Rot, Soil Rot, or any other decay or disease which cannot be removed in the ordinary process of trimming without a loss of more than 20 per cent, by weight, of the tomato in excess of that which would occur if the tomato were perfect.
- (b) Sunburn or sunscald which cannot be removed in the ordinary process of trimming without a loss of more than 20 per cent, by weight, of the tomato in excess of that which would occur if the tomato were perfect.
- (c) Shriveling when the flesh of the tomato is tough and rubbery.

March 1, 1933

