

U.S. Department of Labor
Bureau of Labor StatisticsPRODUCTIVITY AND UNIT LABOR COST IN SELECTED MANUFACTURING INDUSTRIES
1939 - 1945

This release, prepared in the Bureau's Productivity and Technological Development Division, presents indexes of production, wage-earner employment, man-hours, pay rolls, productivity, and unit labor cost for 1939-1945 (1939 = 100) for selected manufacturing industries for which sufficiently complete and reliable data are at present available. The 1945 figures are, in all cases, based on preliminary data. These indexes supersede those given for the period 1939-1944 in earlier mimeographed releases. Attention is called in footnotes to several major revisions.

It will be noted that in 25 of the 29 manufacturing industries for which data are available, the level of productivity during 1945 was above that for 1944. While the gain for many industries is moderate, it represents the first general increase in output per man-hour for these industries since the beginning of the war. The increase in productivity during the year reflects the adjustment of these industries to wartime conditions as well as the relaxation of some controls during the last part of the year. It is probable that increases in productivity thus far experienced mark the beginning of a generally upward trend. As materials and labor become more readily available and as plants resume operations at normal capacities, increases in output per man-hour should be forthcoming. Additional increases should follow the installation of new machines to replace outmoded equipment and the application to peacetime production of new techniques learned during the war.

Another alteration in general trend is notable. Although average hourly earnings increased in all 29 industries between 1944 and 1945, higher productivity levels brought about a reduction in unit labor costs in 11 of the industries. In 5 additional industries increases in unit labor costs were less than 2 percent.

The indexes are generally comparable with those shown on the base 1929 = 100 in the report, Productivity and Unit Labor Cost in Selected Manufacturing Industries: 1919-1940, which was published by the Bureau of Labor Statistics in February 1942. Since the Census of Manufactures has not been taken since 1939, a number of the indexes published in this earlier report, including those for manufacturing as a whole, could not be satisfactorily extended. The changing of the base year from 1929 to 1939 facilitates comparison of present productivity levels with those of late pre-war years and permits publication of a few series for which no adequate 1929 statistics are available. This release includes data for several industries not shown in the 1942 report.

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INSTITUTE OF
INDUSTRIAL RELATIONS

PRODUCTIVITY AND UNIT LABOR COST IN
SELECTED MANUFACTURING INDUSTRIES: 1939 - 1945

(1939 = 100)

Year	Production	Wage earners	Man- hours	Output per --		Pay rolls	Unit labor cost
				Wage earner	Man- hour		
<u>Agricultural Implements</u>							
1939	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1940	124.3	114.3	120.5	108.7	103.2	124.5	100.2
1941	154.1	135.5	148.0	113.7	104.1	171.9	111.6
1942	---	124.3	140.4	---	---	182.7	---
1943	---	135.7	172.4	---	---	256.0	---
1944	---	161.4	206.8	---	---	324.9	---
1945	---	146.6	179.9	---	---	283.0	---
<u>Beet Sugar Refining 1/</u>							
1939	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1940	106.0	103.0	102.4	102.9	103.5	108.0	101.9
1941	90.2	93.4	89.4	96.6	100.9	105.9	117.4
1942	98.2	104.5	105.6	94.0	93.0	141.7	144.3
1943	57.1	78.1	72.5	73.1	78.8	108.6	190.2
1944	59.4	78.8	71.9	75.4	82.6	109.0	183.5
1945	72.3	84.4	82.2	85.7	88.0	131.4	181.7
<u>Boots and Shoes</u>							
1939	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1940	95.6	94.5	90.5	101.2	105.6	93.9	98.2
1941	119.0	99.3	105.1	119.8	113.2	122.1	102.6
1942	116.3	97.2	104.0	119.7	111.8	139.4	119.9
1943	104.5	85.7	94.1	121.9	111.1	136.7	130.8
1944	95.6	79.8	90.3	119.8	105.9	140.4	146.9
1945	98.2	78.5	88.8	125.1	110.6	148.1	150.8
<u>Bread and Other Bakery Products</u>							
1939	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1940	---	99.6	98.9	---	---	102.1	---
1941	108.1	102.8	103.0	105.2	105.0	111.2	102.9
1942	119.0	108.4	111.3	109.8	106.9	131.6	110.6
1943	133.2	110.1	117.8	121.0	113.1	151.8	114.0
1944	135.7	112.1	122.0	121.1	111.2	166.8	122.9
1945	151.7	110.0	120.3	137.9	126.1	173.5	114.4

^{1/} Indexes are on the basis of a fiscal year beginning in March.

Year	Production	Wage earners	Man- hours	Output per--		Pay rolls	Unit labor cost
				Wage earner	Man- hour		
Cane-Sugar Refining							
1939	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1940	103.6	100.2	100.1	103.4	103.5	101.7	98.2
1941	122.6	103.6	108.1	118.3	113.4	113.9	92.9
1942	77.2 <u>1/</u>	91.5	93.2	84.4 <u>1/</u>	82.8 <u>1/</u>	109.2	141.4 <u>1/</u>
1943	102.4	98.3	112.1	104.2	91.3	142.9	139.6
1944	120.7	103.3	125.0	116.8	96.6	165.9	137.4
1945	106.0	97.7	115.0	108.5	92.2	155.5	146.7
Canning and Preserving Group 2/							
1939	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1940	104.0	97.4	95.8	106.8	108.6	99.8	96.0
1941	126.1	108.0	114.1	116.8	110.5	132.3	104.9
1942	140.5	112.5	117.9	124.9	119.2	167.0	118.9
1943	123.5	100.7	107.0	122.6	115.4	174.9	141.6
1944	133.2	105.1	114.1	126.7	116.7	199.9	150.1
1945	131.9	101.1	109.2	130.5	120.8	201.4	152.7
Canned and Preserved Fruits and Vegetables 2/							
1939	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1940	104.6	98.0	97.7	106.7	107.1	102.1	97.6
1941	128.5	108.8	116.4	118.1	110.4	136.0	105.8
1942	149.3	115.2	120.8	129.6	123.6	172.7	115.7
1943	132.3	104.3	109.5	126.8	120.8	182.4	137.9
1944	140.1	108.7	117.1	128.9	119.6	207.1	147.8
1945	137.9	103.9	111.9	132.7	123.2	208.0	150.8
Canned and Cured Fish							
1939	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1940	98.2	93.6	80.2	104.9	122.4	79.5	81.0
1941	106.7	102.8	95.2	103.8	112.1	99.2	93.0
1942	86.9	95.0	94.3	91.5	92.2	116.5	134.1
1943	73.6	76.4	87.2	96.3	84.4	107.5	146.1
1944	87.3	81.5	89.7	107.1	97.3	135.0	154.6
1945	90.7	82.6	87.0	109.8	104.3	142.0	156.6

^{1/} Revised

^{2/} Production index revised--see Notes.

Year	Production	Wage earners	Man- hours	Output per--		Pay rolls	Unit labor cost
				Wage earner	Man- hour		
Cement							
1939	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1940	106.5	102.8	106.1	103.6	100.4	105.9	99.4
1941	134.3	115.4	124.0	116.4	108.3	132.2	98.4
1942	148.2	122.0	136.7	121.5	108.4	155.3	104.8
1943	108.4	100.7	114.5	107.6	94.7	141.2	130.3
1944	73.7	72.9	88.0	101.1	83.8	112.0	152.0
1945	83.3	75.2	93.2	110.8	89.4	122.4	146.9
Clay Construction Products							
1939	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1940	92.4	94.0	89.6	98.3	103.1	83.9	90.8
1941	108.8	103.2	102.3	105.4	106.4	102.6	94.3
1942	82.8	86.4	85.0	95.8	97.4	92.5	111.7
1943	49.6	59.8	61.0	82.9	81.3	73.3	147.8
1944	45.5	52.3	54.8	87.0	83.0	68.7	151.0
1945	51.1	54.6	57.3	93.6	89.2	76.6	149.9
Coke Group							
1939	100.0	100.01/	100.0	100.0	100.0	100.0	100.0
1940	128.0	121.2	122.6	105.6	104.4	122.1	95.4
1941	146.6	136.2	139.2	107.6	105.3	139.2	95.0
1942	158.3	145.0	149.1	109.2	106.2	158.6	100.2
1943	159.0	157.7	161.6	100.8	98.4	177.4	111.6
1944	164.1	154.2	159.1	106.4	103.1	184.2	122.2
1945	150.0	---	---	---	---	---	---
Beehive Coke							
1939	100.0	100.01/	100.0	100.0	100.0	---	---
1940	210.6	211.8	212.4	99.4	99.2	---	---
1941	460.9	448.9	451.8	102.7	102.0	---	---
1942	569.6	545.0	548.4	104.5	103.9	---	---
1943	546.1	499.1	520.9	109.4	104.8	---	---
1944	479.8	385.8	437.5	124.4	109.7	---	---
1945	357.3	---	---	---	---	---	---

1/ Based on man-shifts.

Year	Production	Wage earners	Man- hours	Output per--		Pay rolls	Unit labor cost
				Wage earner	Man- hour		
Byproduct Coke							
1939	100.0	100.0 1/	100.0	100.0	100.0	---	---
1940	124.8	118.4	119.3	105.4	104.6	---	---
1941	134.7	126.8	127.8	106.2	105.4	---	---
1942	142.9	133.0	134.5	107.4	106.2	---	---
1943	145.8	147.4	148.5	98.9	98.2	---	---
1944	153.3	147.2	148.9	104.1	103.0	---	---
1945	141.2	---	---	---	---	---	---
Condensed and Evaporated Milk							
1939	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1940	116.0	103.6	105.7	112.0	109.7	105.4	90.9
1941	145.6	116.5	122.0	125.0	119.3	130.9	89.9
1942	159.9	137.2	147.2	116.5	108.6	176.6	110.4
1943	150.9	134.2	147.6	112.4	102.2	197.2	130.7
1944	171.5	143.1	161.6	119.8	106.1	230.2	134.2
1945	192.2	149.8	171.2	128.3	112.3	253.4	131.8
Confectionery							
1939	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1940	108.9	103.1	103.1	105.6	105.6	104.7	96.1
1941	122.4	110.7	113.0	110.6	108.3	123.7	101.1
1942	123.5	112.9	118.5	109.4	104.2	144.8	117.2
1943	130.6	112.8	122.6	115.8	106.5	166.4	127.4
1944	149.5	116.8	128.4	128.0	116.4	191.1	127.8
1945	138.6	109.4	117.7	126.7	117.8	187.6	135.4
Cotton Goods							
1939	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1940	104.9	104.0	102.3	100.9	102.5	108.4	103.3
1941	132.5	120.7	129.0	109.8	102.7	153.9	116.2
1942	146.1	127.8	142.9	114.3	102.2	198.4	135.8
1943	140.1	122.9	139.0	114.0	100.8	210.8	150.5
1944	126.7	111.0	126.2	114.1	100.4	204.1	161.1
1945	117.3	104.7	116.5	112.0	100.7	204.6	174.4

^{1/} Based on man-shifts.

Year	Production	Wage earners	Man- hours	Output per--		Pay rolls	Unit labor cost
				Wage earner	Man- hour		
Fertilizers							
1939	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1940	111.3	102.0	100.9	109.1	110.3	106.5	95.7
1941	121.4	106.6	109.6	113.9	110.8	127.9	105.4
1942	127.7	114.7	124.6	111.3	102.5	168.7	132.1
1943	149.2	120.9	146.2	123.4	102.1	225.0	150.8
1944	156.9	116.9	145.0	134.2	108.2	250.2	159.5
1945	171.9	120.6	151.9	142.5	113.2	276.4	160.8
Flour and Other Grain-Mill Products							
1939	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1940	97.4	99.9	97.8	97.5	99.6	98.8	101.4
1941	100.3	98.8	100.0	101.5	100.3	106.7	106.4
1942	102.7	101.9	108.4	100.8	94.7	130.2	126.8
1943	113.2	115.2	132.9	98.3	85.2	177.6	156.9
1944	114.9	115.7	134.8	99.3	85.2	191.0	166.2
1945	131.6	120.9	141.5	108.9	93.0	210.9	160.3
Glass Products							
1939	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1940	109.4	107.8	109.6	101.5	99.8	113.4	103.7
1941	138.6	125.4	133.2	110.5	104.1	147.1	106.1
1942	136.7	121.1	132.8	112.9	102.9	156.2	114.3
1943	161.9	126.0	148.2	128.5	109.2	187.6	115.9
1944	166.6	129.5	154.9	128.6	107.6	205.4	123.3
1945	174.2	122.4	143.6	142.3	121.3	195.2	112.1
Hosiery							
1939	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1940	95.5	92.2	88.1	103.6	108.4	91.4	95.7
1941	102.1	92.8	93.6	110.0	109.1	98.7	96.7
1942	94.9	80.8	83.3	117.5	113.9	97.5	102.7
1943	98.8	73.6	80.0	134.2	123.5	107.7	109.0
1944	93.8	66.5	71.9	141.1	130.5	105.4	112.4
1945	89.8	61.8	65.1	145.3	137.9	101.0	112.5

Year	Produc- tion	Wage earners	Man- hours	Output per--		Pay rolls	Unit labor cost
				Wage earner	Man- hour		
<u>Ice Cream</u>							
1939	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1940	104.5	99.2	97.7	105.3	107.0	100.6	96.3
1941	128.1	102.2	100.9	125.3	127.0	108.5	84.7
1942	151.8	103.4	103.2	146.8	147.1	120.7	79.5
1943	135.3	95.1	95.3	142.3	142.0	124.0	91.6
1944	145.9	95.9	96.5	152.1	151.2	134.3	92.0
1945	154.8	99.4	101.1	155.7	153.1	147.2	95.1
<u>Leather</u>							
1939	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1940	93.9	95.6	92.9	98.2	101.1	95.1	101.3
1941	122.2	107.5	111.1	113.7	110.0	124.4	101.8
1942	132.1	107.0	113.4	123.5	116.5	145.6	110.2
1943	116.8	95.6	105.5	122.2	110.7	144.7	123.9
1944	113.7	85.0	99.3	133.8	114.5	145.3	127.8
1945	112.7	83.5	97.7	135.0	115.4	148.8	132.0
<u>Lumber and Timber Products: Sawmills 1/</u>							
1939	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1940	115.2	104.2	103.1	110.6	111.7	109.3	94.9
1941	133.5	124.3	126.6	107.4	105.5	147.2	110.3
1942	133.1	129.6	135.7	102.7	98.1	183.2	137.6
1943	127.9	121.5	134.5	105.3	95.1	208.1	162.7
1944	124.6	117.3	129.8	106.2	96.0	218.2	175.1
1945	103.1	---	---	---	---	---	---
<u>Malt Liquors</u>							
1939	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1940	97.5	99.8	99.5	97.7	98.0	101.8	104.4
1941	109.8	104.6	110.9	105.0	99.0	113.7	103.6
1942	123.6	114.2	122.8	108.2	100.7	136.2	110.2
1943	136.9	126.3	147.4	108.4	92.9	170.1	124.3
1944	155.3	139.7	167.8	111.2	92.6	202.8	130.6
1945	159.0	144.4	171.9	110.1	92.5	217.1	136.5

1/ Production index revised--See Notes.

Year	Production	Wage earners	Man- hours	Output per--		Pay rolls	Unit labor cost
				Wage earner	Man- hour		
<u>Newspaper and Periodical Printing and Publishing</u>							
1939	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1940	104.4	101.2	100.6	103.2	103.8	102.9	98.6
1941	107.7	102.0	101.4	105.6	106.2	106.1	98.5
1942	103.7	98.4	98.1	105.4	105.7	107.4	103.6
1943	99.5	95.2	98.1	104.5	101.4	111.7	112.3
1944	86.0	92.9	98.3	92.6	87.5	116.9	135.9
1945	89.8	94.2	101.2	95.3	88.7	126.1	140.4
<u>Nonferrous Metals: Primary Smelters and Refineries</u>							
1939	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1940	124.8	113.8	115.6	109.7	108.0	118.9	95.3
1941	135.9	128.1	131.8	106.1	103.1	151.5	111.5
1942	138.7	126.3	135.6	109.8	102.3	176.7	127.4
1943	139.9	121.9	140.7	114.8	99.4	200.5	143.3
1944	126.8	109.3	130.2	116.0	97.4	192.0	151.4
1945	115.0	100.2	119.9	114.8	95.9	179.3	155.9
<u>Paints and Varnishes</u>							
1939	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1940	102.3	101.9	102.2	100.4	100.1	105.6	103.2
1941	133.3	114.0	117.1	116.9	113.8	129.7	97.3
1942	121.2	107.9	111.4	112.3	108.8	135.1	111.5
1943	130.1	104.8	118.5	124.1	109.8	152.9	117.5
1944	141.6	106.0	124.1	133.6	114.1	166.0	117.2
1945	147.0	106.0	122.2	138.7	120.3	169.8	115.5
<u>Paper and Pulp Group</u>							
1939	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1940	111.5	106.5	107.0	104.7	104.2	110.8	99.4
1941	129.8	114.8	121.6	113.1	106.7	137.8	106.2
1942	124.6	114.7	122.4	108.6	101.8	155.5	124.8
1943	118.5	108.9	125.1	108.8	94.7	169.9	143.4
1944	117.6	106.5	126.8	110.4	92.7	178.9	152.1
1945	119.9	105.8	126.0	113.3	95.2	183.3	152.9

Year	Production	Wage earners.	Man- hours	Output per--		Pay rolls	Unit labor cost
				Wage earner	Man- hour		
<u>Petroleum Refining 1/</u>							
1939	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1940	103.2	100.3	100.3	102.9	102.9	100.9	97.8
1941	113.5	102.8	105.4	110.4	107.7	113.2	99.7
1942	108.4	98.6	106.8	109.9	101.5	125.8	116.1
1943	118.0	101.6	125.2	116.1	94.2	158.3	134.2
1944	146.9	119.1	153.7	123.3	95.6	203.2	138.3
1945	150.9	125.8	160.6	120.0	94.0	216.8	143.7
<u>Rayon and Allied Products</u>							
1939	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1940	122.2	104.2	107.5	117.3	113.7	112.7	92.2
1941	143.7	109.3	113.0	131.5	127.2	128.2	89.2
1942	158.0	107.0	111.8	147.7	141.3	142.4	90.1
1943	161.7	107.9	119.3	149.9	135.5	162.5	100.5
1944	174.7	109.1	123.5	160.1	141.5	174.2	99.7
1945	189.3	112.9	125.4	167.7	151.0	184.0	97.2
<u>Slaughtering and Meat Packing</u>							
1939	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1940	110.2	109.0	107.9	101.1	102.1	108.1	98.1
1941	117.9	119.4	116.5	98.7	101.2	127.1	107.8
1942	138.3	142.9	144.0	96.8	96.0	170.5	123.3
1943	151.7	136.6	156.5	111.1	96.9	200.1	131.9
1944	162.8	130.6	159.2	124.7	102.3	216.1	132.7
1945	143.8	110.8	129.6	129.8	111.0	181.7	126.4
<u>Tobacco Products Group</u>							
1939	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1940	101.4	98.9	100.7	102.5	100.7	105.0	103.6
1941	109.4	100.6	104.7	108.7	104.5	115.9	105.9
1942	115.9	102.0	110.9	113.6	104.5	136.5	117.8
1943	115.4	97.2	111.5	118.7	103.5	151.0	130.8
1944	116.3	89.9	106.9	129.4	108.8	158.8	136.5
1945	121.2	87.2	102.1	139.0	118.7	164.2	135.5

1/ Production index revised -- see Notes.

Year	Production	Wage earners	Man- hours	Output per--		Pay rolls	Unit labor cost
				Wage earner	Man- hour		
Cigars							
1939	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1940	100.3	97.8	100.3	102.6	100.0	103.7	103.4
1941	107.7	101.7	106.1	105.9	101.5	116.8	108.4
1942	111.7	99.1	108.2	112.7	103.2	132.0	118.2
1943	102.8	83.9	97.3	122.5	105.7	139.7	135.9
1944	99.7	70.5	85.2	141.4	117.0	138.9	139.3
1945	102.7	65.5	77.1	156.8	133.2	136.6	133.0
Cigarettes							
1939	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1940	104.8	105.8	104.8	99.1	100.0	110.3	105.2
1941	120.6	108.4	110.7	111.3	108.9	124.8	103.5
1942	142.5	121.2	127.0	117.6	112.2	159.2	111.7
1943	163.9	135.5	147.7	121.0	111.0	185.4	113.1
1944	179.1	140.5	158.2	127.5	113.2	210.9	117.8
1945	184.2	137.5	153.7	134.0	119.8	219.7	119.3
Chewing and Smoking Tobacco and Snuff							
1939	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1940	100.3	94.0	96.2	106.7	104.3	100.9	100.6
1941	99.7	87.5	92.1	113.9	108.3	101.7	102.0
1942	96.2	87.6	97.4	109.8	98.8	116.8	121.4
1943	95.3	91.2	106.7	104.5	89.3	131.1	137.6
1944	89.4	87.8	105.0	101.8	85.1	135.6	151.7
1945	96.3	92.8	110.5	103.8	87.1	154.1	160.0
Woolen and Worsted Goods							
1939	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1940	---	97.8	97.0	---	---	103.2	---
1941	---	124.2	133.8	---	---	159.8	---
1942	133.5	120.9	133.2	110.4	100.2	189.2	141.7
1943	138.0	111.9	127.9	123.3	107.9	202.2	146.5
1944	136.4	101.1	117.2	134.9	116.4	191.6	140.5
1945	127.9	94.7	108.2	135.1	118.2	184.5	144.3

NOTES

The sources and methods used in preparing these indexes are in most cases the same as those used for intercensal years in the report, Productivity and Unit Labor Cost in Selected Manufacturing Industries: 1919-1940. The procedures used in the preparation of the indexes of production are described below. Except as indicated, the indexes of wage-earner employment and pay rolls are those compiled by the Bureau and the indexes of man-hours were prepared from the Bureau's series for employment and average weekly hours. The indexes of output per wage earner and output per man-hour were derived by division of the production indexes by the indexes of wage-earner employment and man-hours; the indexes of unit labor cost were derived by division of the pay rolls indexes by the indexes of production.

AGRICULTURAL IMPLEMENTS

Production -- The production index is based on weighted aggregates for 35 products. The quantity statistics were obtained from annual reports published by the Bureau of the Census. The production index is not shown after 1941, since available measures do not reflect adequately the extent of war production within this industry and are not comparable with the indexes of employment, man-hours, and pay rolls.

BEET-SUGAR REFINING

Production and employment in this industry are highly seasonal; beets are harvested in the fall and processed during a short "campaign" period. For this reason, the indexes have been constructed on the basis of a fiscal year beginning in March and ending in February of the following year.

Production -- The index is derived from an unweighted series for total beet-sugar refined. Since output of refined sugar per man-hour may be influenced by the sugar content of the beets sliced, an index of beets sliced per man-hour is shown below, for comparison:

<u>Fiscal year, beginning in March</u>	<u>Output per man-hour</u>
1939	100.0
1940	115.2
1941	102.3
1942	105.3
1943	77.8
1944	85.4
1945	102.3

The statistics for production of beet-sugar and for total beets sliced are collected by the Department of Agriculture.

Employment, Man-Hours, and Pay Rolls -- The indexes are averages for the fiscal year based on monthly BLS data.

BOOTS AND SHOES

Production -- The production index is a weighted measure based on the following 5 classes of products: men's shoes, boys' and youths' shoes, women's shoes, misses' and children's shoes, and slippers and all other footwear (except rubber). Due to minor reclassifications and revisions, the index consists of two segments: 1939-44 and 1944-45. The quantity statistics were obtained from monthly reports published by the Bureau of the Census and were adjusted to represent complete coverage.

BREAD AND OTHER BAKERY PRODUCTS

Production -- The index for 1939-44 is based on estimates compiled by the Millers' National Federation for the quantities of wheat flour distributed to the bread and other bakery products and biscuit, crackers, and pretzels industries. The index was extended to 1945 by means of the Federal Reserve Board's index of wheat flour production.

CANE-SUGAR REFINING

Production -- The index is based on data collected by the Department of Agriculture for the output of refined cane sugar.

Man-Hours -- The index was derived from the BLS index of pay rolls and a comparable BLS series for average hourly earnings.

CANNING AND PRESERVING GROUP

Production -- The group production index is a harmonic mean, with changing man-hour weights, of the production indexes for the component industries.

The index for Canned and Preserved Fruits and Vegetables, 1939-44, has been revised to represent quick-frozen fruits and vegetables and dried fruits and to include additional canned products. The new series includes 23 canned fruits and vegetables, 3 dried fruits, as well as quick-frozen fruits and vegetables. The index is an arithmetic mean, with 1939 employment weights, of two component indexes. One, for canned fruits and vegetables and dried fruits, is derived from production data for 26 products weighted by 1929 unit values; the other is based on total production of quick-frozen fruits and quick-frozen vegetables, weighted by average 1944 prices. The relative for 1945 was constructed from preliminary data for 19 of the canned fruits and vegetables together with the dried and frozen items. The production data are compiled by the National Cannery Association and the Department of Agriculture.

The production index for Canned and Cured Fish was derived for 1939-44 from weighted aggregates for 9 products: salmon, pilchard sardines, herring sardines, shrimp, tuna and tuna-like fishes, mackerel, oysters, clam products, and cat and dog food. The relative for 1945 was computed from preliminary data for the first 6 products. The production figures were obtained from reports published by the Fish and Wildlife Service, Department of the Interior.

Employment, Man-Hours, and Pay Rolls -- The indexes for the component industries were obtained from unpublished BLS data. The indexes for the group are based on totals for the two component industries.

CEMENT

Production -- The index was constructed for 1939-44 by the use of 3 series representing successive stages in the production of portland cement--portland-cement clinker, finished portland cement, and portland-cement shipments--and a fourth series for the output of finished masonry, natural, and puzzolan cements. The portland-cement series were weighted by the estimated proportion of total labor requirements devoted to each operation. The relative for 1945 is based on statistics for portland cement production only. The necessary statistics were obtained from annual and monthly reports published by the Bureau of Mines.

Man-Hours -- The index for the period 1939-1944 is based on a series for total man-hours compiled by the Bureau of Mines. The relative for 1945 was derived from the BLS employment index and BLS figures for average weekly hours.

CLAY CONSTRUCTION PRODUCTS

Production -- The index is based on quantity statistics published by the Bureau of the Census, weighted by 1939 unit values. For the years 1939 and 1940 and for the period September 1942 through 1945 an index was constructed from production data for 7 product classes: unglazed brick, glazed brick, glazed hollow facing tile, unglazed hollow facing tile, vitrified paving brick, unglazed structural tile, and vitrified clay sewer pipe. The index was completed by the use of data for 6 of these products for February 1941-September 1942 (sewer pipe was excluded); production for this period was estimated from monthly shipments and stocks figures for identical plants in overlapping two-month intervals.

Employment, Man-Hours, and Pay Rolls -- The indexes are based on unpublished BLS figures for the 1939 Census industries brick and hollow structural tile and sewer pipe and kindred products.

COKE GROUP

Production -- The group production index is a harmonic mean, with changing man-hour weights, of the production indexes for the component industries. Since 1945 employment and man-hours data for the component industries are not yet available, 1944 weights were used in the derivation of the group relative for 1945.

The production measure for Beehive Coke was derived for 1939-44 from aggregates for the quantities of coke produced and the coke equivalents of recovered breeze. The index for Byproduct Coke was derived for 1939-44 from aggregates for the quantities of coke produced and the coke equivalents of recovered breeze, recovered coke-oven gas, tar, and light oil. The relatives for 1945 for the component industries are based on preliminary data for the output of beehive and byproduct coke. The production statistics were obtained from various reports published by the Bureau of Mines.

Employment and Man-Hours -- The employment indexes for the group and components were constructed for 1939-44 by use of Bureau of Mines statistics for man-shifts worked. Indexes of man-hours for the group and components were derived for 1939-44 from man-hours totals compiled by the Bureau of Mines.

CONDENSED AND EVAPORATED MILK

Production -- The index for 1939-44 is based on production data for 16 manufactured dairy products, including condensed and evaporated milk and dried and powdered milk and cream, weighted by 1939 unit values. The production statistics were obtained from published reports of the Bureau of Agricultural Economics; the unit-value weights were derived from data contained in the Census of Manufactures, 1939. The relative for 1945 was prepared from preliminary data for 10 of the 16 products.

CONFECTIONERY

Production -- The index for 1939-44 is based on quantity statistics published by the Bureau of Foreign and Domestic Commerce for candy sales of identical establishments in overlapping two-year periods. A chain index was constructed from weighted aggregates for 9 classes of products. The production index was extended to 1945 by the use of data furnished by the Bureau of the Census for the total poundage of confectionery produced in 1944 and 1945.

COTTON GOODS

Production -- The index was derived from a series of comparable weighted aggregates for 1939 and 1941-45, and was completed for 1940 by use of the Federal Reserve index of cotton consumption. Twelve product classes were combined with 1939 unit-value weights: cotton duck, narrow sheetings, print cloth yarn fabrics, napped fabrics, colored yarn fabrics, fine cotton goods, tire fabrics, toweling, wide fabrics, miscellaneous woven goods, carded yarns produced for sale, and combed yarns produced for sale. The weights (1939 unit values) and the 1939 production figures were obtained from the Census of Manufactures; the production figures for 1941-45, comparable with those for 1939, were collected by the Bureau of the Census.

Man-Hours -- The man-hours index was constructed by use of the BLS index of pay rolls and a comparable BLS series of average hourly earnings.

FERTILIZERS

Production -- The index is based on estimates of quantities of fertilizers sold by commercial producers, compiled by the National Fertilizer Association, and unpublished statistics furnished by the Agricultural Adjustment Agency for amounts of commercially-produced fertilizer distributed by A.A.A.

FLOUR AND OTHER GRAIN-MILL PRODUCTS

Production -- The index for 1939-42 is based on a series for wheat grindings, derived from figures published by the Leland Stanford Food Research Institute for wheat flour production and the corresponding wheat-requirement ratio (bushels of wheat required per barrel of flour). It was extended to 1945 by use of statistics for wheat grindings collected by the Bureau of the Census and adjusted to represent complete coverage.

GLASS PRODUCTS

Production -- The production index consists of two segments. The 1939-41 segment is an arithmetic mean of the indexes for 5 component product classes: glass containers; tumblers; tableware, kitchen and household ware; plate glass; and window glass. The weights are estimates of 1939 employment devoted to each product and were calculated from value-ratios for each item and total employment in the respective industry (flat glass; glass containers; tableware, pressed or blown glass, and glass ware n.e.c.). The segment for 1941-45 is similarly constructed but excludes window glass. The index for the glass containers component is based on shipments data for 8 products, weighted by their respective average unit values for the odd-numbered years from 1927-35. The indexes for the other product classes are derived from unweighted quantity series. The data on which the index is based are published in the Survey of Current Business.

HOSIERY

Production -- The production index is an arithmetic mean, with 1939 man-hour weights, of the production measures for full-fashioned hosiery and seamless hosiery. The production measure for full-fashioned hosiery is an unweighted index based on production data for women's full-fashioned hose. The production measure for seamless hosiery is derived from data for 5 product groups: women's seamless hose, including ribbed goods; men's seamless half-hose and slack socks; cotton and woolen bundle goods; anklets, including athletic socks; and children's and infants' hose. The 5 series were weighted with estimates of unit labor requirements in 1941, obtained through field surveys made by the Bureau of Labor Statistics. The production figures, which represent approximately the entire output of the industry, were obtained from reports published by the National Association of Hosiery Manufacturers.

ICE CREAM

Production -- The index is based on a production series compiled by the Bureau of Agricultural Economics.

LEATHER

Production -- The index is based on quantity statistics compiled by the Tanners' Council for 22 classes of products, combined with 1937 unit-value weights for comparable classes; the weights were derived from the Census of Manufactures.

LUMBER AND TIMBER PRODUCTS: SAWMILLS

Production -- The production index includes three segments: the first, for 1939-41, is based on weighted aggregates for lumber (30 series), lath, and shingles; the 1941-42 segment was derived from figures for aggregate lumber sawed in 24 states for which comparable statistics were available for the two years; the 1942-45 segment is a revised series based on the production of hardwood and softwood, each weighted by unit labor requirements in 1935. The data were obtained from reports published by the Bureau of the Census and the Forest Service.

Employment, Man-Hours, and Pay Rolls -- The indexes of employment and pay rolls are based on the BLS series, adjusted by the use of data compiled by the Bureau of Employment Security of the Federal Security Agency. The index of man-hours was derived from the adjusted employment series, and the BLS series for average weekly hours. Adequate labor data were not available for the extension of the indexes to 1945.

MALT LIQUORS

Production -- The index is based on statistics collected by the Bureau of Internal Revenue for the total production of fermented malt liquors.

NEWSPAPER AND PERIODICAL PRINTING AND PUBLISHING

Production -- The index was derived from a series for newsprint consumption by publishers, compiled by the American Newspaper Publishers Association and published in the Survey of Current Business.

NONFERROUS METALS: PRIMARY SMELTERS AND REFINERIES

Production -- The production measure for 1939-44 is based on data for 14 classes of products weighted with 1929 estimated unit values added. The relative for 1945 was derived from preliminary statistics for the 6 most important products: primary copper, secondary copper, refined primary lead, antimonial lead, secondary pig lead, and primary zinc. The production data were obtained from Bureau of Mines publications.

Employment, Man-Hours, and Pay Rolls -- The indexes are based on unpublished BLS figures for copper, lead, and zinc smelting.

PAINTS AND VARNISHES

Production -- The index was constructed by means of an annual series for sales (value) of paints, varnishes, lacquers, and fillers, deflated by a weighted price index. The sales series, which is published by the Bureau of the Census, represents approximately 90 percent of the estimated total sales of the industry. The price measure is based on BLS price relatives for 18 products weighted by the corresponding value of sales in 1926.

PAPER AND PULP GROUP

Production -- The group index is a harmonic mean, with man-hour weights, of the production relatives for the component industries.

The indexes for the component industries are:

	<u>Paper</u>	<u>Pulp</u>
1939	100.0	100.0
1940	108.3	127.5
1941	126.7	144.8
1942	120.0	149.1
1943	115.6	132.3
1944	113.8	137.3
1945	116.4	137.1

The index for the Paper industry was derived from production data for 6 product classes--book paper, writing paper, newsprint and similar papers, tissue paper, wrapping paper, and paperboard--weighted with estimated unit labor requirements. Because of slight changes in classification made in the basic statistics, the index includes two segments, one for 1939-41 and another for 1941-45.

The production series for the Pulp industry is based on the quantities of 6 classes of wood pulp weighted with estimated unit labor requirements: sulphite pulp, bleached; sulphite pulp, unbleached; sulphate pulp, bleached; sulphate pulp, unbleached; soda pulp; and mechanical pulp. Since there have been slight changes in coverage and classification, the index includes three segments: 1939-40, 1940-41, and 1941-45.

PETROLEUM REFINING

Production -- The index is a new series derived from production data compiled by the Bureau of Mines for 7 products: aviation gasoline, 100 octane and above; other aviation gasoline; other gasoline; distillate fuel oil; residual fuel oil; kerosene; and lubricating oil, weighted by 1943 prices.

Employment, Man-Hours, and Pay Rolls -- The BLS index of employment for the years 1942-44 was adjusted, by means of data furnished by the Petroleum Administration for War, to exclude construction workers. A proportionate adjustment was made in the BLS pay rolls index for the same years. The man-hours index was prepared from the revised employment index and the BLS figures for average weekly hours.

RAYON AND ALLIED PRODUCTS

Production -- The index is a weighted measure derived from statistics published in Rayon Organon for the following 4 product classes: yarns finer than 113 denier, yarns of 113 to 162 denier, yarns heavier than 162 denier, and rayon staple fibre.

SLAUGHTERING AND MEAT PACKING

Production -- The production series is based on weighted aggregates for 11 products. The quantity statistics, which were adjusted to levels shown by the 1939 Census of Manufactures, were obtained from reports published by the Department of Agriculture.

TOBACCO GROUP

Production -- The group production index is a harmonic mean, with changing man-hour weights, of the production relatives for the 3 component industries.

The production index for the Cigars industry was constructed for 1939-44 by use of data for the aggregate annual output of large and small cigars (including large cigars made in bonded warehouses); the relative for 1945 is based on tax-paid withdrawals of cigars, as estimated from stamp sales. The index for the Cigarettes industry is based on statistics for the aggregate production of large and small cigarettes, including tax-paid and tax-free withdrawals. The series for the Chewing and Smoking Tobacco and Snuff industry is based on the aggregate poundage of tobacco and snuff produced.

The basic statistics for the 3 components are collected by the Bureau of Internal Revenue.

Employment, Man-Hours, and Pay Rolls -- The indexes for the group and the component industries are based on BLS data. Since a considerable quantity of chewing and smoking tobacco and snuff is made in the Cigarettes industry, the labor data for the Cigarettes and Chewing and Smoking Tobacco and Snuff industries were adjusted for comparability with the production series.

WOOLEN AND WORSTED GOODS

Production -- The index for 1939 and 1942-45 was derived from a series of comparable weighted aggregates for 11 product classes combined with 1939 unit-value weights. The 11 product classes include: men's suitings and pantings; men's shirtings; men's over-and top-coatings; women's and children's wear; melton, mackinaw, snow-and ski-suit cloths; linings and interlinings; bathrobe flannels; other apparel; blankets; other non-apparel; and woven felts. The weights and the 1939 production figures were obtained from the 1939 Census of Manufactures; the production figures for 1942-45 were collected by the Bureau of the Census.