

THE SEED-CRUSHING TRADE.

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Introductory.*

The tables on pages 73 to 76 are based on returns received from firms in Great Britain whose business in 1924 consisted wholly or mainly in the extraction of oils from vegetable seeds, nuts or kernels. The number of such separate returns was 49. No production was recorded for Northern Ireland in 1924.

Summary of results.—The following table shows the main results of the Censuses of 1924, 1912 and 1907, comparisons between the figures for the three years being subject to the qualifications mentioned in the next paragraph :—

Particulars.	Unit.	1924.	1912.	1907.
Value of goods made (Gross output)	£'000	36,422	16,686	12,961
Cost of materials used	„	32,512	14,925	11,573
Net output	„	3,910	1,761	1,388
Average number of persons employed	No.	14,027	10,261	7,696
Net output per person employed	£	279	172	180
Mechanical power available :—				
Prime movers	H.P.	50,529	35,903	26,492
Electric motors driven by purchased electricity	„	22,987	2,965	(not recorded)

* See also the Notes on pages vii to xv.

Qualifications affecting comparisons.—In considering the above table and the other tables in this report which show figures for different censal years, it should be borne in mind that :—

(1) The comparability of figures relating to value or cost is affected by the changes which have taken place in the general purchasing power of money.

(2) The Censuses of 1907 and 1912 covered Great Britain and the whole of Ireland, but that of 1924 applied only to Great Britain and Northern Ireland. No production was recorded for Northern Ireland in 1924. The exclusion of Southern Ireland in 1924 cannot, however, seriously affect the comparability of the figures.

(3) The Censuses of 1907 and 1924 extended to all firms, however small, but in 1912 firms employing not more than five persons (excluding the proprietors) were merely required to state the average number of persons employed by them in the year. According to the information so furnished, the number of persons employed in the establishments thus excluded was only 26. Correspondence on defective returns for 1912 had not been completed when the war compelled suspension of this work and in these circumstances detailed information for 1912 is not given in the remainder of this report. The resulting defects in the aggregate figures given above are, however, not important.

Value of output and cost of materials.—The figures in the above table representing the value of goods made and the cost of materials used, are the aggregates of the figures recorded by the firms that made returns, and, for the reasons explained in paragraphs (i) and (ii) on page xiii, they probably over-state the value of the output of, and the cost of the materials used by, the Seed-Crushing Trade considered as a whole. The matter is discussed on page 70, where it is estimated that the value, free from duplication, of the output of the Seed-Crushing Trade in 1924 lay between £34,122,000 and £34,622,000, and the cost of materials purchased from sources outside the trade and worked up into its products lay between £30,212,000 and £30,712,000.

Production.

Detailed information as to the output of the Seed-Crushing Trade in 1924 will be found in Table II on pages 73 and 74.

Principal products.—At the 1907 Census seed-crushers were only required to state the quantity and value of their main output for sale in one aggregate of "oil, oilcakes and sundries," but in 1924 considerable detail was required. The figures given in the following table show, for 1924 and 1907, the total output for sale of the principal products of the Seed-Crushing Trade, including the output of similar products recorded on schedules for other trades.

Kind of goods.	1924.		1907.	
	Quantity.	Selling value.	Quantity.	Selling value.
	Th. tons	£'000	Th. tons	£'000
Crude oils (sold or added to stock)	332·4	13,728	1,400	13,167
Refined oils	275·6	13,147		
Oil-seed cake and meal	1,510·4	13,918		
Acid oils .. .. .	..	449		
Black grease .. .. .	..	113		
Waste products and sundries ..	..	52		
TOTAL VALUE : PRINCIPAL PRODUCTS .. .. .	..	41,407	..	13,167

More detailed particulars relating to the output in 1924 are given in the paragraphs which follow.

Total make of crude oils.—The following table shows the total make of crude oils in 1924 as returned by seed-crushers (including oils which they subsequently refined as well as oils which they sold or put into stock in the crude state), and the total make of such oils in 1907 as estimated from information furnished voluntarily. The retained imports of oil seeds, nuts and kernels in 1924 are also shown for purposes of comparison.

Kind of goods.	Retained imports of oil-seeds, nuts and kernels.	Total make of crude oil.	
		1924.	1907.
		Th. tons	Th. tons
Cotton seed		558·3	87·4
Linseed		444·1	124·8
Rape seed		66·3	25·6
Coconut		70·8	46·2
Ground nut		88·3	30·3
Palm kernel		287·6	127·7
Soya bean		111·5	16·5
Other crude oils		99·2	25·4
TOTAL		1,726·1	483·9
			112·0
			106·0
			14·0
			18·0
			250·0

In addition to the output of crude oils returned by seed-crushers a relatively small quantity was extracted by certain firms in the Soap, Candle and Perfumery Trades, but this output was not recorded separately. Allowing for this latter output, it is estimated that the total output of crude oils in 1924 was about 494,000 tons, or nearly double the estimated output in 1907.

Crude oils sold or added to stock.—Particulars of the output of crude oils sold or added to stock by seed-crushing firms will be found in Table IIB on page 74. No output for sale was reported by firms in other trades. It will be seen that, out of the total make of 483,900 tons shown above, 332,400 tons were sold or added to stock, leaving 151,500 tons for refining by the firms that crushed the seeds.

Exports and imports of crude oils.—In the following table the total production of the chief kinds of crude oils is compared with the exports and retained imports in 1924 :—

Kind of crude oils.	Total make.	Exports.	Net imports.	Available for refining in United Kingdom.
	Tons.	Tons.	Tons.	Tons.
Coconut	46,200	1,200	16,700	61,700
Cotton seed	87,400	3,400	1,900	85,900
Ground nut	30,300	8,200	2,000	24,100
Linseed	124,800	15,800	2,400	111,400
Palm kernel	127,700	28,300	—	99,400
Rape seed	25,600	12,100	500	14,000
Soya bean	16,500	14,100	29,300	31,700
Other crude oils	25,400	8,500	4,300	21,200
TOTAL : CRUDE OILS	483,900	91,600	57,100	449,400

Very little crude palm oil is produced in this country and the exports (2,500 tons) and net imports (62,000 tons) are, therefore, not included in the above table.

Refined oils.—The following table shows the output for sale of refined oils in 1924, as returned on the schedules for the Seed-Crushing Trade and for all trades. Figures for 1907 are not available.

Kind of refined oils.	Returned on schedules for			
	The Seed-Crushing Trade.		All trades.	
	Quantity.	Selling value.	Quantity.	Selling value.
	Th. tons	£'000	Th. tons	£'000
Coconut	27.5	1,412	27.5	1,412
Cotton seed	74.6	3,396	78.7	3,591
Ground nut	11.2	601	11.2	603
Linseed :—				
Boiled	4.9	213	8.1	357
Refined	1.3	65	1.6	83
Not distinguished	—	—	37.8	1,613
Palm kernel	13.5	656	13.5	656
Rape seed	9.6	445	15.7	731
Soya bean	17.6	786	17.7	791
Other and unspecified	16.6	932	63.8	3,310
TOTAL : REFINED OILS	176.8	8,506	275.6	13,147

It will be seen that there are large differences between the quantities of unrefined oils available and the output of the corresponding refined oils for sale, particularly in the cases of linseed, palm kernel, coconut, ground nut and soya bean oils. These differences represent the quantities that were used in the crude state by soap makers, paint makers, linoleum manufacturers, etc., or were refined by them for use in making more finished products.

Oil-seed cake and meal.—The total output for sale of oil-seed cake and meal of specified kinds and also of compound cake and meal in 1924 is shown below :—

Kind of oil-seed cake and meal.	Returned on schedules for			
	The Seed-Crushing Trade.		All trades.	
	Quantity.	Selling value.	Quantity.	Selling value.
	Th. tons	£'000	Th. tons	£'000
Coconut	29.1	254	29.1	254
Cotton seed	413.0	3,253	414.5	3,274
Ground nut	45.3	412	45.6	415
Linseed	271.6	3,163	279.7	3,269
Palm kernel	116.4	796	116.4	796
Rape seed	34.4	204	34.4	204
Soya bean	80.9	835	80.9	835
Compound and other, including unspecified cake and meal	464.2	4,485	509.8	4,871
TOTAL : OIL-SEED CAKE AND MEAL	1,454.9	13,402	1,510.4	13,918

It was estimated that the total output of oil-seed cake in 1907 was 1,146,000 tons, of which cotton seed accounted for 551,000 tons, linseed for 250,000 tons, rape seed for 36,000 tons, and compound and other cake and meal for 309,000 tons.

Exports and imports of refined oils and oil-seed cake and meal.—The exports and retained imports of the more important refined oils and of oil-seed cakes in 1924 are set out in the following table. No production of olive oil was recorded by seed-crushing firms in 1924, and particulars of exports and imports of olive oil are not included below.

Kind of oil and oil-seed cake and meal.	Exports.	Net imports.
	Th. tons	Th. tons
Refined vegetable oil :—		
Coconut	2.0	6.9
Cotton seed oil	19.0	5.4
Ground nut oil	1.5	2.9
Linseed :—		
Boiled	12.6	0.1
Refined	2.1	0.2
Palm kernel oil	3.0	0.3
Other sorts (excluding olive oil)	4.8	1.4
TOTAL : REFINED OILS	45.0	17.2
Oil-seed cake and meal :—		
Cotton seed	9.5	163.3
Ground nut	4.7	74.8
Linseed	22.3	72.0
Rape seed	0.1	33.4
Soya bean	5.2	2.0
Compound and other sorts	53.4	14.7
TOTAL : CAKE AND MEAL	95.2	360.2

Other products.—In addition to the principal products shown in the preceding tables firms that made their returns on schedules for the Seed-Crushing Trade recorded an output of soap and lard compound, valued at £423,000. These goods are dealt with in the reports on those trades in which they are mainly produced. The corresponding figure for 1907 was £21,000.

Value of output free from duplication.—The gross value of the output of the firms that made their returns on schedules for the Seed-Crushing Trade in 1924 was returned as £36,422,000. The output of crude and refined oils and of by-products appears to be free from substantial duplication.

As regards oil-seed cakes there may have been duplication in some part of the compound cake made, in so far as it was made from cake purchased from other firms in the trade. From a scrutiny of the individual returns and other relevant information, it appears that the maximum amount of duplication would amount to about 265,000 tons, of a value of about £2,300,000, but those amounts would be decreased in so far as imported cake was used for compounding. It seems possible that not more than 200,000 tons of cake may have been purchased from British makers for compounding, involving a cost of about £1,800,000, the remainder of the cake for compounding being bought from importers. The duplication may thus be estimated as lying between £1,800,000 and £2,300,000. The value, free from duplication, of the output of the Seed-Crushing Trade in 1924 may accordingly be put at a figure lying between £34,122,000 and £34,622,000.

Cost of materials.—The cost of materials used by firms that made their returns on schedules for the Seed-Crushing Trade was returned as £32,512,000 in 1924, a sum which, by the exclusion of purchases of the products of other firms in the trade, is reduced to a sum estimated to lie between £30,212,000 and £30,712,000. The corresponding net figure for 1907 was approximately £11,500,000.

Net output.—The net output in 1924 of the firms that made their returns on schedules for the Seed-Crushing Trade (whose gross output was valued at £36,422,000) was £3,910,000, that sum representing, without duplication, the total amount by which the value, as delivered, of the aggregate output exceeded the cost, as purchased, of the materials used.

The net output per head of persons employed in the censal year 1924 was £279, as compared with £180 in 1907.

Wages in 1924.

Under the Census of Production Act, 1906, the powers of the Board of Trade to require information do not extend to particulars of the amount of wages paid, and, consequently, no information on this

head was secured in connexion with the Census of 1924. As a result, however, of the voluntary enquiry undertaken by the Ministry of Labour into wages and hours in the United Kingdom in 1924, information was obtained as to the total wage-bill of a group of firms in the Seed-Crushing Trade that made returns both to the Ministry of Labour and to the Census of Production office. According to the Census records this group of firms employed, in the week ended 18th October, 1924, 11,726 operatives, or 98 per cent. of the total of 11,947 operatives for the trade as a whole, and their net output totalled £3,826,000, or 98 per cent. of the aggregate net output of £3,910,000 for the trade as a whole. The total wage-bill of these firms, as returned to the Ministry of Labour, was £1,728,000, representing about 45 per cent. of their aggregate net output.

Employment.

The detailed information relating to employment in 1924 is summarised in Table III, on page 75.

The following table sets out certain particulars for that year, together with those relating to 1907. For the purpose of this comparison, the average numbers of operatives of each sex returned for 1924 have been divided between the two age-groups in the proportions shown by the data relating to the week ended 18th October:—

Average number.	Males.		Females.		Males and females.	
	Under 18.	All ages.	Under 18.	All ages.	Under 18.	All ages.
1924.						
Operatives	225	11,726	71	335	296	12,061
Administrative, etc. ..	92	1,506	26	460	118	1,966
TOTAL	317	13,232	97	795	414	14,027
1907.						
Wage earners	113	6,753	—	52	113	6,805
Salaried	88	859	3	32	91	891
TOTAL	201	7,612	3	84	204	7,696

The numbers of operatives recorded month by month in 1924 ranged from 726 above the average, in April, to 920 below the average, in July (see Table IIIB, page 75).

Mechanical Power.

The detailed information relating to mechanical power in 1924 is summarised in Table IV on page 76. The following table sets out the particulars for 1924 and 1907 relating to the capacity and kinds of *prime movers* and the capacity of *electric generators* installed.

Power equipment.	1924.			1907.
	Ordinarily in use.	In reserve or idle.	Total.	Total.
PRIME MOVERS :—	H.P.	H.P.	H.P.	H.P.
Reciprocating steam engines ..	30,825	6,873	37,698	25,259
Steam turbines	5,046	4,941	9,987	261
Gas engines	419	1,730	2,149	722
Petrol and light oil engines ..	5	—	5	
Heavy oil engines	—	590	590	
Water power	100	—	100	250
TOTAL	36,395	14,134	50,529	26,492
ELECTRIC GENERATORS :—	Kw.	Kw.	Kw.	Kw.
Driven by—				
Reciprocating steam engines	2,480	3,617	6,097	1,061
Steam turbines	3,760	3,615	7,375	35
Gas engines	10	1,135	1,145	—
Heavy oil engines	—	400	400	—
TOTAL	6,250	8,767	15,017	1,096

The capacity of *electric motors* recorded in 1924 was as shown below :—

Electric motors.	Ordinarily in use.	In reserve or idle.	Total.
Driven by—	H.P.	H.P.	H.P.
Electricity generated in own works	16,698	1,288	17,986
Purchased electricity	15,305	7,682	22,987

Corresponding information was not required for 1907. The total number of Board of Trade units of electricity purchased for power and lighting purposes in that year was returned as 53,000.

Machinery Equipment.

In response to a request for voluntary information as to the number of presses at seed-crushing works at the end of 1924 and their weekly capacity, firms whose output of crude oils amounted to 469,000 tons, or 97 per cent. of the total make of crude oils in the year, gave the information shown in the following table. The similar information obtained at the 1907 Census from firms with an output of crude oils representing about 94 per cent. of the total make in that year, is also given :—

Year.	Presses.	Weekly capacity.
1924.	Number	Tons
In use	1,422	40,010
Idle	388	10,330
TOTAL	1,810	50,340
1907.		
TOTAL	1,745	33,025

TABLES.

I.—Summary of results.

Note.—No production was recorded for Northern Ireland.

Particulars.	Unit.	England and Wales.	Scotland.	Great Britain.
Value of goods made (Gross output)	£'000	34,021	2,401	36,422
Cost of materials used	„	30,371	2,141	32,512
Net output	„	3,650	260	3,910
Average number of persons employed	No.	13,087	940	14,027
Net output per person employed	£	279	277	279
Mechanical power available :—				
Prime movers	H.P.	47,618	2,911	50,529
Electric motors driven by purchased electricity	„	21,337	1,650	22,987

II.—Production.

A.—TOTAL MAKE OF CRUDE OILS, AS RETURNED ON SCHEDULES FOR THE SEED-CRUSHING TRADE.

Kind of oil.	England and Wales.	Scotland.	Great Britain.
	Tons.	Tons.	Tons.
Coconut	46,200	—	46,200
Cotton seed	77,100	10,300	87,400
Ground nut	*	*	30,300
Linseed	108,200	16,600	124,800
Palm kernel	127,700	—	127,700
Rape seed	*	*	25,600
Soya bean	*	*	16,500
Other crude oils	*	*	25,400
TOTAL : CRUDE OILS	455,300	28,600	483,900

* In order to avoid the possible disclosure of information relating to individual firms, figures are given only for Great Britain as a whole.

B.—OUTPUT SOLD OR ADDED TO STOCK.

Goods sold or added to stock.	England and Wales.		Scotland.		Great Britain.	
	Quantity.	Selling value.	Quantity.	Selling value.	Quantity.	Selling value.
	Tons.	£'000.	Tons.	£'000.	Tons.	£'000.
Crude oils :—						
Coconut	17,800	788	—	—	17,800	788
Cotton seed	24,500	999	5,400	213	29,900	1,212
Ground nut	*	*	*	*	18,800	868
Linseed	104,100	4,210	14,600	587	118,700	4,797
Palm kernel	113,300	4,644	—	—	113,300	4,644
Rape seed	*	*	*	*	15,800	648
Soya bean	*	*	*	*	4,800	187
Other oils	13,300	583	†	1	13,300	584
TOTAL : CRUDE OILS	*	*	*	*	332,400	13,728
Refined oils :—						
Coconut	27,500	1,412	—	—	27,500	1,412
Cotton seed	67,800	3,087	6,800	309	74,600	3,396
Ground nut	*	*	*	*	11,200	601
Linseed :—						
Boiled	*	*	*	*	4,900	213
Refined	*	*	*	*	1,300	65
Palm kernel	13,500	656	—	—	13,500	656
Rape seed	9,600	445	—	—	9,600	445
Soya bean	*	*	*	*	17,600	786
Other and unspecified oils	16,400	923	200	9	16,600	932
TOTAL : REFINED OILS	*	*	*	*	176,800	8,506
Oil-seed cake and meal :—						
Coconut	29,100	254	—	—	29,100	254
Cotton seed	348,000	2,763	65,000	490	413,000	3,253
Ground nut	*	*	*	*	45,300	412
Linseed	237,100	2,737	34,500	426	271,600	3,163
Palm kernel	116,400	796	—	—	116,400	796
Rape seed	*	*	*	*	34,400	204
Soya bean	*	*	*	*	80,900	835
Compound and other oil-seed cake and meal.. ..	447,700	4,336	16,500	149	464,200	4,485
TOTAL : OIL - SEED CAKE AND MEAL..	1,334,200	12,292	120,700	1,110	1,454,900	13,402
Acid oils .. ..	..	221	—	—	..	221
Black grease	*	*	*	*	..	90
Waste products and sundries .. ..	..	52	—	—	..	52
Other products (soap and lard compound) ..	..	423	—	—	..	423
TOTAL VALUE OF GOODS MADE (GROSS OUTPUT)	..	34,021	..	2,401	..	36,422

* In order to avoid the possible disclosure of information relating to individual firms, figures are given only for Great Britain as a whole.

† Under 50 tons.

III.—Employment.

A.—NUMBERS EMPLOYED IN WEEK ENDED 18TH OCTOBER, 1924.

Kind of staff.	Males.		Females.		Males and females.	
	Under 18.	All ages.	Under 18.	All ages.	Under 18.	All ages.
<i>England and Wales :—</i>						
Operatives	207	10,904	70	311	277	11,215
Administrative, etc.*..	81	1,388	23	422	104	1,810
TOTAL	288	12,292	93	733	381	13,025
<i>Scotland :—</i>						
Operatives	16	711	—	21	16	732
Administrative, etc.*..	11	118	3	38	14	156
TOTAL	27	829	3	59	30	888
<i>Great Britain :—</i>						
Operatives	223	11,615	70	332	293	11,947
Administrative, etc.*..	92	1,506	26	460	118	1,966
TOTAL	315	13,121	96	792	411	13,913

* Administrative, technical and clerical staff.

B.—OPERATIVES EMPLOYED IN ONE WEEK IN EACH MONTH OF 1924.

England and Wales. (Annual average : Males, 10,966 ; Females, 311 ; Total, 11,277.)

Week ended.	Males.	Females.	Total.	Week ended.	Males.	Females.	Total.
Jan. 12th ..	11,119	302	11,421	July 19th ..	10,059	316	10,375
Feb. 16th ..	11,291	290	11,581	Aug. 16th ..	10,266	309	10,575
Mar. 15th ..	11,635	294	11,929	Sept. 13th ..	10,654	314	10,968
April 12th ..	11,610	324	11,934	Oct. 18th ..	10,904	311	11,215
May 17th ..	11,287	329	11,616	Nov. 15th ..	11,012	307	11,319
June 21st ..	10,573	318	10,891	Dec. 13th ..	11,188	314	11,502

Scotland. (Annual average : Males, 760 ; Females, 24 ; Total, 784.)

Jan 12th ..	739	26	765	July 19th ..	742	24	766
Feb. 16th ..	786	26	812	Aug. 16th ..	795	24	819
Mar. 15th ..	705	28	733	Sept. 13th ..	776	21	797
April 12th ..	826	27	853	Oct. 18th ..	711	21	732
May 17th ..	791	28	819	Nov. 15th ..	756	21	777
June 21st ..	707	25	732	Dec. 13th ..	782	24	806

Great Britain. (Annual average : Males, 11,726 ; Females, 335 ; Total, 12,061.)

Jan. 12th ..	11,858	328	12,186	July 19th ..	10,801	340	11,141
Feb. 16th ..	12,077	316	12,393	Aug. 16th ..	11,061	333	11,394
Mar. 15th ..	12,340	322	12,662	Sept. 13th ..	11,430	335	11,765
April 12th ..	12,436	351	12,787	Oct. 18th ..	11,615	332	11,947
May 17th ..	12,078	357	12,435	Nov. 15th ..	11,768	328	12,096
June 21st ..	11,280	343	11,623	Dec. 13th ..	11,970	338	12,308

IV.—Mechanical Power.

PARTICULARS OF PRIME MOVERS, ELECTRIC GENERATORS AND ELECTRIC MOTORS.

Power equipment.	England and Wales.		Scotland.		Great Britain.	
	Ordinarily in use.	In reserve or idle.	Ordinarily in use.	In reserve or idle.	Ordinarily in use.	In reserve or idle.
	H.P.	H.P.	H.P.	H.P.	H.P.	H.P.
PRIME MOVERS :—						
Reciprocating steam engines	28,111	6,756	2,714	117	30,825	6,873
Steam turbines	5,046	4,941	—	—	5,046	4,941
Gas engines	399	1,680	20	50	419	1,730
Petrol and light oil engines	5	—	—	—	5	—
Heavy oil engines	—	590	—	—	—	590
Water power	90	—	10	—	100	—
TOTAL	33,651	13,967	2,744	167	36,395	14,134
TOTAL OF PRIME MOVERS INSTALLED	47,618		2,911		50,529	
	Kw.	Kw.	Kw.	Kw.	Kw.	Kw.
ELECTRIC GENERATORS :—						
Driven by—						
Reciprocating steam engines	2,291	3,596	189	21	2,480	3,617
Steam turbines	3,760	3,615	—	—	3,760	3,615
Gas engines	10	1,135	—	—	10	1,135
Heavy oil engines	—	400	—	—	—	400
TOTAL	6,061	8,746	189	21	6,250	8,767
TOTAL OF ELECTRIC GENERATORS INSTALLED	14,807		210		15,017	
	H.P.	H.P.	H.P.	H.P.	H.P.	H.P.
ELECTRIC MOTORS :—						
Driven by—						
Electricity generated in own works	16,301	1,275	397	13	16,698	1,288
Purchased electricity	13,837	7,500	1,468	182	15,305	7,682