

## NATIONAL FLOUR AND BREAD

From the Scientific Adviser's Division,  
Ministry of Food

THIS report, the fifth to be issued<sup>1</sup>, covers the samples of flour examined in the period January 1 to September 2, 1944, and loaves from January 1 to October 2.

### Quality of Flour

423 samples were analysed with the following results :

Fibre		Vitamin B <sub>1</sub>	
Value per cent	Per cent of samples	I.U./gram	Per cent of samples
0.4 or less	10.9	1.1 or more	3.3
0.5 "	52.7	1.05 "	12.3
0.55 "	70.7	1.0 "	35.7
0.6 "	80.7	0.95 "	62.1
0.7 "	92.7	0.9 "	82.0
0.8 "	98.1	0.8 "	97.1

The fibre figures are corrected for any added white flour.

*Riboflavin, Nicotinic Acid, Iron, Protein, Ash and Maltose.* For these determinations the samples received in each of the months January-June inclusive were compounded.

Month	No. of samples	Riboflavin ( $\mu\text{gm./gm.}$ )	Nicotinic acid ( $\mu\text{gm./gm.}$ )	Iron (mgm./100 gm.)	Protein per cent	Ash* (per cent)	Fibre (per cent)	Maltose (per cent)
January	72	1.2	17	2.15	10.9	1.0	0.50	2.35
February	64	1.2	17	2.12	10.8	0.97	0.50	2.3
March	60	1.3	17	1.94	10.0	0.96	0.50	2.3
April	60	1.4	17	1.98	10.8	0.94	0.50	2.1
May	40	1.4	16	2.01	10.9	0.96	0.50	2.05
June	50	1.3	17	2.20	10.8	1.04	0.50	2.3

\* All the flours were fortified with calcium carbonate at the rate of 7 oz. per sack of 280 lb. The ash due to this addition would average 0.12 per cent. No skim milk powder was added after March 1944.

Average figures for National flour in the period were therefore :

B <sub>1</sub>	0.95-1.0 I.U./gm.	Protein	10.7 per cent
Riboflavin	1.3 $\mu\text{gm./gm.}$	Fibre	0.50 "
Nicotinic acid	17 "	Ash	0.98 "
Iron	2.07 mgm./100 gm.	Maltose	2.2 "

*Granularity.* In 1944 (up to October 4) 549 samples of flour have been examined with the following results :

Samples	% over 5 silk	% over 8 silk
1-100	1.2	4.7
101-200	1.1	4.4
201-300	0.8	4.1
301-400	0.7	3.7
401-549	1.0	4.3

Aperture No. 5 silk = 0.270 mm.  
" No. 8 " = 0.190 "

*Baking Quality.* All the flours were test-baked under optimum conditions of water absorption and fermentation, and the resulting bread graded according to quality (commercial standards).

257 samples of flour gave	good bread = 60.7 per cent of samples.
81 " " " " " fair-good	" = 19.2 " " " "
67 " " " " " fair	" = 15.8 " " " "
18 " " " " " poor	" = 4.2 " " " "

### Quality of Bread

3,358 loaves from different parts of Great Britain were graded for quality (commercial standards).

Good	= 461 loaves = 13.7 per cent
Fair-Good	= 1393 " = 41.5 " "
Fair	= 1027 " = 30.6 " "
Poor	= 477 " = 14.2 " "

It will be observed that the first two groups totalled 55 per cent against 80 per cent for the flours baked under ideal conditions in the laboratory.

This work was carried out at the Cereals Research Station, Ministry of Food, St. Albans.

<sup>1</sup> See *Nature*, 149, 460 (1942); 150, 538 (1942); 151, 629 (1943); 153, 154 (1944).

## PHYSICO-CHEMICAL ANALYSIS IN U.S.S.R.

IN 1904 Prof. N. S. Kurnakov (1860-1941) invented a new form of recording pyrometer which was a great improvement on that of Roberts-Austen. In 1910 Prof. A. A. Baikov still further improved this pyrometer by a modification which allowed the recording of the differential curve to be superimposed on the ordinary cooling or heating curve. This apparatus provided a very delicate method for the thermal analysis of alloys and minerals, called by Kurnakov in 1913 'physico-chemical analysis'<sup>1</sup>. Through the initiative and enthusiasm of Kurnakov, a very flourishing school of research was established, and in 1918 a special Institute of Physico-Chemical Analysis was founded at the Academy of Sciences.

The scope and purpose of this Institute was defined by Kurnakov in the following words: "The Institute of Physico-Chemical Analysis has for its aim the study of the relations between the composition and the measurable properties of systems in equilibrium of two or more components. Being in reality one of the subdivisions of general chemistry, physico-chemical analysis can be of a wide application in the border regions of theoretical and applied science—mineralogy, petrology, geology, metallurgy and applied and structural mechanics. It is a very significant fact that a systematic investigation of the diagram 'composition-properties', the essential method of this new chemical discipline, allows us to draw conclusions about the nature of solid, liquid or gaseous substances, without subjecting them to the usual chemical operations of separation. Because of that, a whole range of substances—alloys, glasses, slags, rocks, liquid and solid solutions, colloidal systems and various ores—are now included within the range of a systematic chemical investigation"<sup>2</sup>.

In 1940 the friends of N. S. Kurnakov decided to celebrate his eightieth anniversary by publishing a special volume of collected papers. The sad event of Kurnakov's death on March 19, 1941<sup>3</sup>, made it necessary to recast the proposed volume and a memorial volume was published instead<sup>4</sup>. This volume contains twenty-nine articles written by Kurnakov's close associates and friends. The first eight articles deal with the biography, bibliography and the scientific work of Kurnakov. Every application of the physico-chemical analysis—alloys, organic