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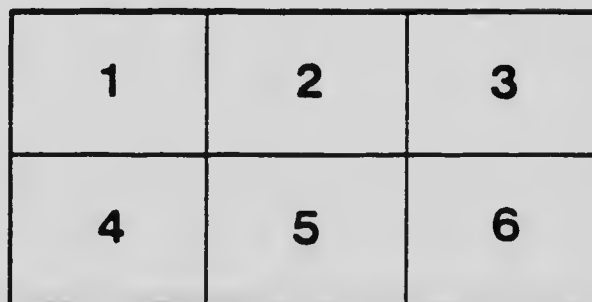
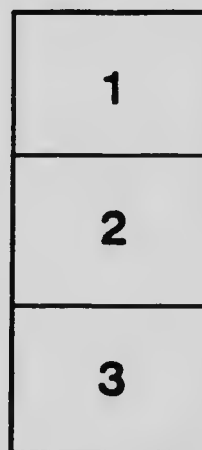
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LABORATORY
OF THE
INLAND REVENUE DEPARTMENT
OTTAWA, CANADA

BULLETIN No. 354

GLUTEN FLOUR, Etc.

NOTES AND COMMENTS.

Under this heading, as occasion arises, the Bulletins issued by this Department will contain, as an appendix, such comment as may seem necessary or advisable upon matters relating to the work of the Department in connection with the administration of the Adulteration Act, the Fertilizers Act, the Feeding Stuffs Act or the Proprietary Medicines Act.

It frequently happens that correspondents ask information regarding the above Acts, of such a nature that the matter in question possesses general interest, and comment upon it would prove acceptable and useful to others than the immediate questioner. In such cases the reply may find a place in these columns. For convenience of reference these notes will be numbered in series.

A. MCGILL,
Chief Analyst.

LABORATORY
OF THE
INLAND REVENUE DEPARTMENT
OTTAWA, CANADA

BULLETIN No. 354

GLUTEN FLOUR, Etc.

OTTAWA, November 16, 1916.

J. U. VINCENT, Esq.,
Deputy Minister of Inland Revenue.

SIR,—We have on many occasions during recent years been asked to make an examination of the cereal foods offered especially for the use of persons suffering from diabetes mellitus. These foods, of which a considerable number are on the market, are usually high priced articles: that they should be costly in comparison with ordinary cereal foods, is but reasonable. If they fulfil their claim to contain a high percentage of cereal protein, in consequence, a comparatively small percentage of starch, their manufacture necessitates the employment of a correspondingly large amount of raw material, as well as the use of skilled labour.

The wrong done to sufferers from diabetes caused by misrepresentation of the character of these foods, is very apparent; and the demand that we should require foods of the class referred to, to meet definite standards is not at all unreasonable. It is acknowledged by physicians that the use of foods containing starch or sugar (glycogenic carbohydrates) in large amount, is dangerous to persons suffering from diabetes; and the whole class of foods to which I refer is characterized by relatively low carbohydrate content. That carbohydrates should be entirely absent is neither necessary nor desirable; but the degree of toleration of carbohydrates must be determined by the physician in each individual case.

It is evident that intelligent advice can only be given when the physician is correctly informed as to the composition of the food which he prescribes. Alike, then, from the point of view of physician and patient, it is necessary that dietary foods for the diabetic should be standardized; and the name under which such foods are sold, should carry a definite meaning.

The work of the Agricultural Experiment Station at New Haven, Conn. during the past five years (see reports for 1911 to 1915) has demonstrated that many of the special foods sold for the use of diabetics, are essentially fraudulent; and national attention has been called to the matter by the excellent work done in Connecticut and elsewhere. In consequence of this, the following decision has quite recently been issued by the Department of Agriculture at Washington.

FOOD INSPECTION DECISION 100.

Gluten products and "Diabetic" Food.

The following definitions and standards for gluten products and "diabetic" food were adopted by the Joint Committee on Definitions and Standards April 9, 1915, and were approved by the Association of American Dairy, Food, and Drug Officials, August 3, 1915, and by the Association of Official Agricultural Chemists, November 17, 1915:

Ground gluten is the clean, sound product made from wheat flour by the almost complete removal of starch and contains not more than ten per cent (10%) of moisture, and, calculated on the water-free basis, not less than fourteen and two-tenths per cent (14.2%) of nitrogen, not more than fifteen per cent (15%) of nitrogen-free extract (using protein factor 5.7) and not more than five and five-tenths per cent (5.5%) of starch (as determined by the diastase method).

Gluten flour is the clean, sound product made from wheat flour by the removal of a large part of the starch and contains not more than ten per cent (10%) of moisture, and, calculated on the water-free basis, not less than seven and one-tenth per cent (7.1%) of nitrogen, not more than fifty-six per cent (56%) of nitrogen-free extract (using the protein factor 5.7), and not more than forty-four per cent (44%) of starch (as determined by the diastase method.)

Gluten flour, self-raising, is a gluten flour containing not more than ten per cent (10%) of moisture, and leavening agents with or without salt.

"Diabetic food. Although most foods may be suitable under certain conditions for the use of persons suffering from diabetes, the term "diabetic" as applied to food indicates a considerable lessening of the carbohydrates found in ordinary products of the same class, and this belief is fostered by many manufacturers on their labels and in their advertising literature.

A "diabetic" food contains not more than half as much glycogenic carbohydrates as the normal food of the same class. Any statement on the label which gives the impression that any single food in unlimited quantity is suitable for the diabetic patient is false and misleading.

The foregoing definitions and standards are adopted as a guide for the officials of this Department in enforcing the Food and Drugs Act.

D. F. HOUSTON,
Secretary of Agriculture.

WASHINGTON, D.C., January 3, 1916.

It will be noted that the terms "ground gluten" "gluten flour" and "diabetic food" are more or less closely defined. In the present state of our knowledge, I do not think it practicable to be more specific than the requirements of the Decision above quoted.

The present report concerns 21 samples purchased by our inspectors under various names, but all evidently intended for the use of sufferers from diabetes. They may be classified as follows:

Gluten flour	9 samples.
Gluten meal	3 "
Gluten bread	3 "
Diabetic bread	1 "
Diet flour	2 "
Dainty Fluffs	1 "
Gum Gluten Granules	1 "
Casoid Biscuits	1 "
Total	21 samples.

In order to apply standards effectively it should be required of manufacturers that, in addition to whatever specific name they may chose to give their product, a subtitle should be used, and legibly printed on the label, fixing the special class:—ground gluten, gluten flour or diabetic food to which the article conforms.

It will be noted that ground gluten is required to contain at least 14.2 per cent. of nitrogen (equivalent to 80.94 per cent. protein, if the factor 5.7 is used, or 88.75 per cent if the usual factor, 6.25 is used); gluten flour, 7.1 per cent. nitrogen (equivalent to 40.47 or 44.375 per cent. protein) or half the amount contained in gluten.

Diabetic foods generally, are required to contain not more than half the amount of carbohydrates that a normal food of the same class would contain.

The starch limit for gluten is fixed at 5.5 per cent. and for gluten flour at 44 per cent.

Wynter Blyth (quoted by Allen 1, 459) gives the following proteid and carbohydrate percentages for wheaten bread:—calculated on the loaf containing moisture.

	Minimum.	Maximum.	Mean for Fine bread.	Mean for Coarse bread.
Water.	36.39	47.00	38.51	41.02
Proteids.	4.81	8.69	6.82	6.23
Carbohydrates.	39.75	67.45	49.97	48.69

The average proteids and carbohydrates in ordinary bread, calculated upon the dry material, would therefore be.

For fine bread	{ Proteids.	11.91 per cent.
	{ Carbohydrates.	81.26
For coarse bread	{ Proteids.	10.56
	{ Carbohydrates.	82.55

According to this standard, diabetic breads should not contain above about 40 per cent. of carbohydrates, calculated upon the dry material; and by a parity of reasoning they should contain at least 22 per cent. of proteids.

I have used the following numbers as a guide in interpreting the results of analysis. It must be remembered that, in the absence of legalized standards, my conclusions must be regarded as merely expressions of opinion.

Limits for

	Proteids. (Minimum).	Carbohydrates. (Maximum).
Gluten.	80	6
Gluten Flour.	40	45
Diabetic Breads.	20	42

Three (3) samples meet the required standard for gluten, and five (5) samples meet the standard suggested for diabetic flour or bread.

The remaining thirteen (13) samples do not justify any reasonable claim to be regarded as diabetic foods.

I beg to recommend publication of this report as Bulletin No. 354.

I have the honour to be, Sir,
Your obedient servant,

A. MCGILL,
Chief Analyst.

BULLETIN No. 354—

Date of Collection.	Nature of Sample.	No. of Sample.	Name and Address of Vendor.	Cost.		Name and Address of Manufacturer or Furnisher, as given by the Vendor.	
				Quantity.	Cents.	Manufacturer.	Furnisher.

DISTRICT OF NOVA SCOTIA—

1916.							
Mar. 17	Gluten Flour.	64451	H. E. Wilson, Windsor, N.S.	2 lbs.	20	North Western Cereal Co., London, Ont.	N. D. & Co., Halifax.
April 7	Diet Flour....	64452	Allison's Ltd., Halifax...	3 "	30	White Swan Spice Co., Toronto.	Mfr.....
" 10	Gluten Flour.	64453	Nat. Drug Co., Halifax.	2 "	20	North Western Cereal Co., London, Ont.	"

DISTRICT OF MONTREAL—

May 9	Gluten Bread.	67661	Fraser, Viger Co., Montreal.	3 l'ves	38	James Strachan...	.....
" 9	Gluten Flour.	67662	" "	1½ lb.	15	Farwell & Rhine, Watertown, N.Y.	.....
" 9	Gluten Bread.	67663	John Robertson & Sons, Montreal.	2 l'ves	20	James M. Aird...	.....

DISTRICT OF OTTAWA—

Feb. 17	Gluten Meal..	70673	Bryson, Graham, Ltd., Ottawa.	3 pks.	90	Battle Creek San. Co., Ltd., Battle Creek, Mich.	.....
" 17	" ..	70674	" "	3 "	1.65	" "	.....
" 17	Gluten Flour..	70675	" "	3 lbs.	66	Farwell & Rhine, Watertown, N.Y.	.....

DISTRICT OF TORONTO—

Mar. 7	Dainty Fluff..	72663	Michie & Co., Ltd., 7 King st., W., Toronto.	1 pkg.	35	The Pure Gluten Food Co., New York.	.....
" 7	Gum Gluten Granules.	72664	The T. Eaton Co., Ltd., Queen and Yonge sts., Toronto.	3 "	30	" "	.....
" 7	Diet Flour....	72665	White Swan Mills, Pearl st., Toronto.	156 2½ lbs.	20	Vendors .....	.....
" 12	Gluten Health Bread.	72666	Canada Bread Co., Floor and Dundas sts., Toronto.	1 loaf.	5	" .....	.....
" 8	Gluten Meal..	72667	Good Health Supply Co., 36 Gothic ave., Toronto.	1 lb..	60	The Kellogg Food Co., Battle Creek	.....
" 10	Diabetic Bread	72668	Nasmith's Ltd., 42 Duchess st., Toronto.	1 loaf.	10	Vendors.....	.....

GLUTEN FLOUR, Etc.

Inspector's Report. (Is not an expression of opinion.)	Results of Analysis.								No. of Sample.	Remarks and Opinion of the Chief Analyst.
	Moisture.	Ash.	Nitrogen.	Protein.	Fat.	Fibre.	Nitrogen Free Ex- tract.	Starch.		

R. J. WAUGH, INSPECTOR.

	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.		
.....	8.80	.....	2.07	12.97	.....	.....	.....	60.60	64451	Much below suggested standard.
.....	10.20	.....	2.06	12.90	.....	.....	.....	60.75	64452	" "
.....	11.10	.....	2.42	15.13	.....	.....	.....	54.68	64453	" "

D. J. KEARNEY, INSPECTOR.

.....	6.20	2.20	.....	18.49	0.6	0.10	72.37	52.74	67661	Much below suggested standard.
.....	10.65	0.45	.....	19.13	0.96	0.04	68.71	63.39	67662	" "
.....	8.10	2.05	.....	14.06	0.72	0.70	74.31	59.75	67663	" "

J. A. RICKEY, INSPECTOR.

20%	7.55	1.35	.....	28.83	1.02	0.12	61.13	55.03	70673	Below standard requirements.
40%	7.35	1.20	.....	43.16	0.92	.....	47.37	41.12	70674	Meets standard requirements.
.....	7.05	0.35	.....	44.03	1.0	.....	47.57	41.35	70675	" "

H. J. DAGER, INSPECTOR.

.....	7.15	1.25	.....	80.04	0.82	0.12	10.62	7.65	72663	Meets standard for gluten.
.....	6.95	0.80	.....	43.16	0.92	0.08	48.09	40.50	72664	Meets standard requirements.
.....	11.25	0.90	.....	10.30	1.06	0.10	75.79	67.84	72665	Much below standard for diabetic flour.
.....	7.45	1.95	.....	16.87	3.26	0.78	69.19	57.86	72666	Much below standard.
.....	5.10	0.45	.....	80.63	1.76	0.18	11.88	3.10	72667	Meets standard for gluten.
.....	8.15	1.75	.....	11.38	1.24	.....	78.48	63.71	72668	Much below standard.

BULLETIN No. 354—

Date of Collection.	Nature of Sample.	No. of Sample.	Name and Address of Vendor.	Cost.		Name and Address of Manufacturer or Furnisher as given by the Vendor.	
				Quantity.	Cents.	Manufacturer.	Furnisher.

DISTRICT OF MANITOBA—

1916.							
April 3	Gluten Flour.	72086	Robinson & Co., McIntyre Block, Winnipeg.	3pkts.	75	North Western Cereal Co., London, Ont.	.....
" 3	"	72087	Hudson's Bay Co., Main st., Winnipeg.	1½ lb.	1.10	Health Food Co., New York.	.....
" 4	"	72088	W. F. C. Braithwaite, 288 Main st., Winnipeg.	2 "	1.60	Gallard, Stewart & Watt, London, Eng.	.....

DISTRICT OF VANCOUVER—

April 12	Casoid Biscuits.	55541	Owl Drug Co., Granville and Dunsmuir sts., Vancouver.	1 tin.	1.50	Gallard, Stewart & Watt, London, Eng.	.....
" 13	Gluten Flour.	55542	Georgia Pharmacy, Georgia and Granville sts., Vancouver.	1 bag.	1.75	Golden Rod Milling Co., Portland, Ore.	.....
" 14	"	55543	Campbell, Ltd., Granville Hastings sts., Vancouver	1 "	1.25	North Western Cereal Co., London, Ont.	.....

GLUTEN FLOUR, ETC.

Inspector's Report. (Is not an expression of opinion.)	Results of Analysis.								No. of Sample.	Remarks and Opinion of the Chief Analyst.
	Moisture.	Ash.	Nitrogen.	Protein.	Fat.	Fibre.	Nitrogen Free Ex- tract.	Starch.		

J. B. COSGROVE, INSPECTOR.

p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.		
9.3			12.69					53.2	72066	Much below standard.
7.7			45.51					35.0	72067	Meets proposed standard.
9.7			80.50					0.0	72068	Meets gluten standard.

E. J. MORGAN, INSPECTOR.

7.52		8.99	56.18	27.10				Trace.	55541	Meets standard for bread.
12.12		2.47	15.43	1.25				66.97	55542	Much below standard.
12.77		1.78	11.12	2.02				64.80	55543	" "

