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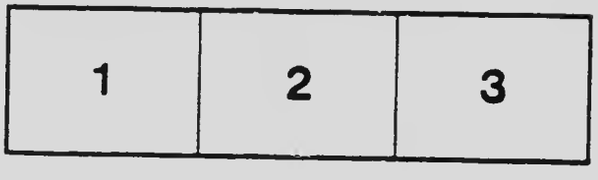

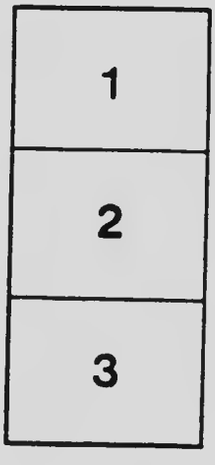

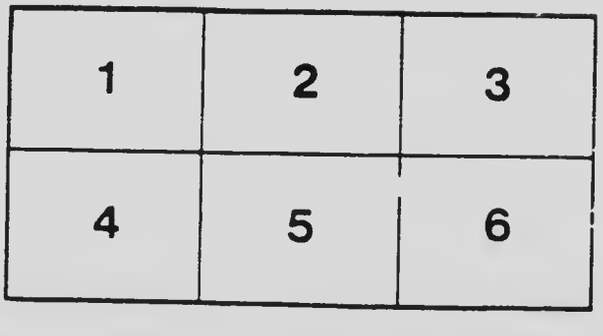

LABORATORY

OF THE

INLAND REVENUE DEPARTMENT

OTTAWA, CANADA

BULLETIN No. 228

A Study of Maple Syrup.

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BULLETIN No. 228

A Study of Maple Syrup.

OTTAWA, October 18, 1911.

W. J. GERALD, Esq.,
Deputy Minister of Inland Revenue.

SIR,—I have the honour to submit herewith a report upon 456 samples of maple syrup, and would preface the report as follows:—

Standards for the judging of maple sugar and maple syrup were promulgated by order in council under section 26 of the Adulteration Act, on March 22 of this year; becoming legally effective on April 25. The following is a synopsis of these standards as applied to maple syrup.

'Maple syrup is syrup, made by evaporation of maple sap, or by the solution of maple concreto in water; and contains not more than thirty-five (35) per cent of water. The total ash, reckoned as a percentage on the dry matter of the syrup, shall not be less than 0·5 (five-tenths of one per cent). The malic acid, determined in prescribed manner, shall not be less than 0·4 (four-tenths of one per cent), reckoned as a percentage on the dry solids. The lead subacetate number, determined as prescribed, shall not be less than 2·2 (two and two-tenths).'

These limits were fixed as a result of large experience upon commercial samples of maple syrup. The data referred to will be found in Bulletins 45, 102, 120, 141, 155, 157 and 214, issued from these laboratories, and cover more than one thousand samples. Most of these are market syrup, obtained in the usual way by our inspectors; but many of them carried trustworthy guarantees of genuineness, and a considerable number were made under the direct supervision of a member of our staff.

It was believed that the standard limits enacted as described were so written as to make it impossible that a sample of genuine maple syrup made entirely from maple sap, could be judged other than genuine. Samples more or less sophisticated might escape detection; but no danger of stamping a genuine maple syrup as adulterated, was thought to be possible.

Nevertheless disquieting rumours found currency, to the effect that maple syrup samples of undoubted genuineness were being called in question, under our standards; and the matter appeared to be sufficiently serious to justify investigation.

With this end in view, I caused a large number of requests to be sent to makers of maple syrup, asking them to furnish me with small samples of syrup, of their own manufacture, and accompanied by a declaration of genuineness, in the following form:—

DECLARATION.

I have learned that one of the greatest difficulties found in the legal protection of the genuine maple syrup and sugar industry is due to insufficient knowledge of the limits of variability which may be found in the genuine maple products themselves.

For the purpose of assisting in the acquisition of necessary data, I am sending this sample to the Department of Inland Revenue at Ottawa, and I hereby certify that this maple syrup has been made by myself and is known to me to be genuine, and is entirely the product of the maple tree.

Signed. . . . . .
Post Office Address. . . . . .

As a result of this appeal, I received the samples now reported; and I desire here to express my gratitude to the senders, and my appreciation of their willingness to supply full information as to the modes of working and kindred matters.

Since the object of this investigation is the ascertaining of fullest knowledge regarding the character of maple syrup, I have felt it desirable to avail myself of every source of authentic information on the subject; and I have especially to acknowledge the valuable data presented in Bulletin No. 134 of the Bureau of Chemistry, Washington, D.C.

A detailed study of the results of analysis is subjoined; and I may merely add here that the contention regarding present standards for maple products, that they exact a higher lead acetate number than is afforded by some genuine maple syrups, is substantiated. Of 456 samples examined by the authorized method, 31 samples, most if not all, of undoubted genuineness, fail to reach the legal requirements. When these samples are worked for lead number by the Winton method, 15 samples are still found below legal requirements, the equivalent standard by the Winton method being considered.

Under these conditions it is apparent that our standards must be rewritten, since it goes without saying that there must be no possibility of penalizing a genuine article.

I would therefore respectfully recommend that the maple products standards of March 2, be revised, as follows:—; and may add that in this recommendation, I am supported by Dr. W. H. Ellis and Dr. J. T. Donald, the other members of your advisory board.

PROPOSED STANDARDS FOR MAPLE PRODUCTS.

MAPLE SUGAR.

Maple Sugar is the solid product resulting from the evaporation of maple sap, or of maple syrup, and contains not more than ten (10) per cent of water. It yields not less than six-tenths (0·6) of one per cent of ash, reckoned on the dry matter of the sugar, when incinerated in such a way as to assure the earths being present as salts, and not as oxides; and not less than twelve one-hundredths (0·12) of one per cent of ash insoluble in water, employed as described below. It yields not less than three-tenths (0·3) per cent of malic acid, reckoned on the dry matter, when worked as described below. It yields a *lead number* not less than one and seven-tenths (1·7), when worked by the Canadian method, nor less than one and two-tenths (1·2), when worked by the Winton method, as described below.

MAPLE SYRUP.

Maple Syrup is syrup made by the evaporation of maple sap, or by the solution of maple concrete in water; and contains not more than 35 per cent of water. The dry substance of maple syrup shall meet all the above standards for maple sugar.

METHODS OF WORKING.

Water, in maple sugar, shall be determined by heating to 100° C. 5 grammes of the finely powdered sugar, spread upon a watch glass, to constant weight. The loss of weight shall be reckoned as water.

Water in maple syrup shall be determined by drying 5 grammes of the syrup, on asbestos fibre or in admixture with sand, to constant weight, at a temperature not exceeding 100° C. The loss of weight shall be reckoned as water.

Total ash, in both maple sugar and maple syrup, shall be determined by gentle ignition of 5 grammes in platinum, to the point of incipient charring, after which ignition to constant weight shall be completed in a muffle, at as low a temperature as possible. The resultant ash is then treated with ammonium carbonate in solution, dried and gently ignited, when the weight should remain unchanged.

Insoluble ash is determined by treating the total ash with 40 cc. of hot water, and gently boiling for two minutes. The contents of the dish are then thrown upon a small ashless filter, and washed with hot water till the total filtrate amounts to 100 cc.

Malic acid.—Six and seven-tenths (6·7) grammes of the dry sugar, or its equivalent amount in syrup, is weighed into a 200 cc. beaker and water added to make a volume of 20 cc. The solution is made slightly alkaline with ammonia, 1 cc. of a ten per cent solution of calcium chloride is added; then 60 cc. of 95 per cent alcohol. The beaker is covered with a watch glass and heated for one-half hour on a water bath, when the flame is turned off and the beaker left to stand over night. The material in the beaker is then filtered through a good quality filter paper, the precipitate washed with hot 75 per cent alcohol to freedom soluble calcium salt, dried and ignited. From 15 to 20 cc. of tenth normal hydrochloric acid is added to the ignited residue, the lime thoroughly dissolved by careful boiling, and the excess of acid titrated with normal sodium hydroxide, using methyl orange as an indicator. One-tenth of the number of cubic centimeters of acid neutralized express the result, which for the present will be called 'Malic Acid Value.'

Lead Number, Canadian Method.

Five grammes of the dry sugar or its equivalent in syrup is dissolved in water, to a volume of 20 cc. Two (2) cc. of a solution of [illegible]etate of lead is added, and the solutions thoroughly mixed. After standing for two (2) hours, the precipitate is filtered off, using a Gooch crucible or a sugar tube with asbestos, and washed four or five times with hot water, using the suction pump. The dried and weighed. The weight of the dry precipitate in grammes is multiplied [illegible]. The product is the *lead subacetate number.*

Mode of preparation of solution of subacetate of lead as follows:—

Boil for half an hour 430 grammes of normal [illegible]tate and 130 grammes of litharge with 1,000 cc. water. Cool the mixture, allow to settle, and dilute the supernatent liquid to 1:26 specific gravity.

Winton method.

Twenty-five grammes (25) of dry sugar, or its equivalent in syrup is transferred to a 100 cc. flask with water. Add 25 cc. of the standard lead acetate solution and shake; fill to the mark, shake and allow to stand at least three hours, filtering. From the clear filtrate, pipette off 10 cc. to a 250 cc. beaker, add 40 cc. [illegible] and 1 cc. of concentrated sulphuric acid; shake and add 100 cc. of 95 per cent [illegible]. Let stand over night, filter on a tared Gooch crucible, wash with 95 per cent [illegible] in a water oven, and ignite over a Bunsen burner, applying the heat [illegible]

Cool and weigh. Subtract the increase in weight of lead sulphate from the weight of the blank. Multiply the difference by the factor 27·325. The determination of the blank is made as follows:—

Transfer 25 cc. of the standard lead acetate solution to a 100 cc. flask, add a few drops of acetic acid, and make up the whole to the mark with water. Shake, and use 10 cc. for the determination of lead, as directed in the preceding section.

NOTE.—If the maple syrup samples have undergone fermentation in any degree, the carbonic acid must be boiled off, before adding the lead acetate solution. This with either of the above methods.

2. If crystallization of sugar has taken place in maple syrup samples, this must be redissolved, by gently warming the sample, before proceeding with the analysis.

These standards for maple syrup are based essentially upon work reported, in Bulletin 229; and represent minimum values for critical data found in genuine samples of maple syrup. Commercial samples failing to reach the requirements named will be held to be illegally adulterated. But it does not follow that samples meeting these standards are necessarily genuine Certain values possessed by the data named, in relation to each other, may be shown to be as essential to genuineness as the data themselves considered singly.

From the elementary composition of the ash, and other results of analysis, it may be possible to prove adulteration, even in samples which give lead and malic acid numbers, meeting the requirements of the standards above defined.

In submitting these revised standards for maple products. I am conscious that the lowering of the lead number and the malic acid number, rendered necessary by considerations which have been placed before you in detail, makes it quite possible for fraud to be perpetrated in the maple sugar and maple syrup industry with increasing difficulty of detection. This industry is a very important one, particularly in some sections of Canada; and it affords a source of profitable employment to the farmer at a period of the year when farm work is not otherwise pressing. For this reason, it is very desirable that the small manufacturer should be protected from the unfair competition of mixtures of cane and maple sugars, which although wholesome and desirable food substances, are not legal maple sugar or syrup.

Recognizing the difficulty of affording as perfect protection as could be wished, by inspection under the Adulteration Act, I would respectfully suggest the offer of a reward to any person able to prove the manufacture and sale of maple products which are adulterated. If a substantial penalty for adulteration of maple goods were specifically named, one moiety of it to go to the informer, in case of his making good his charges, this would, I venture to think, prove a powerful deterrent to fraudulent practices which now prevail.

I beg to recommend the publication of this report as Bulletin 129.

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

A. McGILL,
Chief Analyst.

MAPLE SYRUP.

Syrups are fundamentally solutions of one or more sugars in water. Since sugar is the costly component, it is reasonable to require that a commerical syrup should contain a specified amount of sugar. Hence the necessity for fixing a legal minimum percentage of sugar, or a maximum percentage of water, or a minimum density for the syrup, or a minimum weight per gallon.

The syrup of the British Pharmacopœia may be taken as typical; and it is legal syrup by virtue of its being defined by the pharmacopœia. It is made by dissolving 5 lbs. of refined sugar in distilled water, the finished product to weigh 7½ lbs. The specific gravity is 1·330. This syrup contains 66·7 per cent by weight of sugar; and, of course, 33·3 per cent of water.

In the 456 samples of syrup herein reported, the water content ranges from 25 to 50 per cent of the weight of the syrup, and is distributed as follows. The water percentage being stated to the nearest integral number:—

Percentage of Water.	Number of Samples.	Percentage of Total.	
25	1	0·22	
27	1	0·22	
28	3	0·66	
29	2	0·44	
30	47	10·30	
31	97	21·27	88 p.c.
32	106	23·25	
33	68	14·91	
34	41	9·00	
35	36	7·90	
36	18	3·95	
37	21	4·60	
	5	1·10	
	6	1·30	
	2	0·44	
41	1	0·22	
50	1	0·22	
	Total.. 456		

More than 88 per cent of these samples fall within a 35 per cent limit for water; while more than 96 per cent of them fall within a 37 per cent limit. A thirty-five per cent limit for water corresponds to a weight of 13 lbs. 2 oz per imperial gallon; a specific gravity of 1·320 at the ordinary temperature or to 35·6° Baumé. I have designated samples containing more than 35 per cent of water, as having water in excess, for the reason that 35 per cent of water is sufficient to keep the sugar in permanent solution, and a higher amount of water than this is inconsistent with the definition of a syrup as furnished by the British pharmacopœia, and moreover conduces to ready fermentation, unless kept sterilized. Of 395 samples of maple syrup reported, in Bulletin 134 of the Bureau of Chemistry, Washington, 1910, none containing as much as 35 per cent water showed crystallization of the sugar; and our experience in the 456 samples of Canadian syrup now reported, is to the same effect.

Such a syrup as is defined by the pharmacopœia, has the characteristic sweetness of sugar and is nearly colourless. As might be expected from its mode of preparation, it has no special flavour, and for the purpose intended by the pharmacopœia, this is an advantage. It is easily intelligible that instead of adding the refined sugar to distilled water, a syrup of proper density may be produced by concentrating a dilute solution of sugar in water. The dilute solution in question may be a natural one, as the juice of the sugar cane or the sap of the maple tree. Inspissation may be effected by evaporation of the water; or by freezing and separating the floating ice. A syrup produced in this way will differ from B. P. syrup chiefly in the fact that any substances other than sugar naturally present in the sap, will remain in the syrup, except so far as processes of manufacture have removed them. When the sap has been boiled, any components volatile at the boiling temperature will be lost. Substances rendered insoluble by concentration, may be removed by filtration or sedimentation; or, if sufficiently light to float on the syrup, they may be skimmed off. Such non-sugar components as are not removed from the syrup, by one or other method indicated, will remain in solution, and may give medicinal or aromatic or other properties to such syrups.

When the sap of the maple tree (hard or soft maple) is the material employed, and the method is one of evaporation by heat, the resultant product is *maple syrup*. This article has a higher market value than the simple syrup of the pharmacopœia; and so far as I can discover, this increased value is due to its special and agreeable flavour. Maple syrup may also be made by dissolving maple sugar in water to a proper consistency.

Like any other manufactured product, maple syrup may be injured in process of manufacture. The sap may be carelessly collected, and many impurities introduced; or the syrup may be burned during the evaporation, producing caramelization, and a burnt taste. Failure to separate floating impurities may leave it turbid and unattractive. In all such cases we have spoiled maple syrup; but *maple syrup* nevertheless. I wish to insist upon this point; because maple syrup is made by thousands of persons who have had no technical training, who use very crude appliances, and to whom the making of maple syrup is merely an incident in the year's work. But they are, nevertheless, honest in their intention to produce a bona fide maple syrup; and it would be palpably wrong to legalize any definition of the article which could stigmatize their output as adulterated. This output may be of low grade, but it is maple syrup.

There is another class of makers of maple syrup who are punctilious in regard to collection and subsequent treatment of the sap. They prevent the introduction of foreign matters into it, avoid caramelization of the sugar, and are careful to separate matters thrown out of solution on concentrating. The final product has very little colour, and the agreeable flavour of the maple is not hidden or disguised by caramel. This product is surely maple syrup; and it would be unwarrantable to legalize any definition of the article which would fail to recognize it as such. The following conclusions appear to be justified by the above considerations:—

1. Colour is not an essential character of maple syrup.
2. Clearness is not an essential character of maple syrup.
3. *A pure maple flavour* is not an essential of maple syrup.

Colour, clearness and flavour are undoubtedly of importance in determining the commercial value of maple syrup; but they are not essential to its specific identity. And further, the use of actual maple sap, *and of nothing else,* as a raw material in the manufacture of maple syrup, is essential. No operation ostensibly having for its object the amelioration of the product, but which introduces into this product anything that did not already exist in the maple sap, is permissible, where the product is sold simply as maple syrup.

The sugar which is present in maple sap is sucrose, and is chemically and physically identical with the sucrose of sugar cane and beet root. In the natural juices of sugar cane and beet root, the sucrose is associated with other substances in solution, as is the case with sucrose in the sap of the maple tree. The difference is that these other substances, if allowed to remain in the juice while this is concentrated by evaporation to the consistency of syrup, cause the product to have a disagreeable flavour, in the cases of cane and beets, while in the case of maple sap, the characteristic flavour is pleasant, and the resultant syrup is in demand on this account. For this reason, more or less complex processes are resorted to, in the manufacture of cane and beet juices with the object of freeing the sugar from all other matters, and the sugar so obtained is usually found on the market in a highly refined state, and is indeed one of the purest food substances known, being often above 99 per cent sucrose. As such it is identical with the sucrose of maple sap; and, so far as healthfulness goes, a solution of this sugar, having proper consistency, may be added to maple syrup, with the production of a desirable table syrup. But such a mixture is not maple syrup; and it should not be sold as such. It is conceivable that, where a specially high-flavoured maple syrup is used, the mixture may possess a sufficiently distinct maple flavour to be indistinguishable by the palate, from actual maple syrup.

If imperfectly refined cane or beet sugar is employed, the characteristic impurities of cane or beet juice, will appear in the mixture, and will, naturally, interfere more or less, with the true maple flavour. Since, however, as has been stated above, much maple syrup is carelessly or crudely made, a mixture of the kind indicated may find sale and, indeed, we know that such mixtures do find sale, at times.

From what has been said, the necessity of having some standard for maple syrup, independent of its sugar, its flavour, its colour or its clearness, will be apparent. Even if we knew to what the flavour of maple syrup is due, and could quantitatively determine this constituent, the great variation in the intensity of flavour recognized in genuine samples would compel us to accept a minimum amount of the flavour-giving constituent as exempting the sample from condemnation as adulterated. Such minimum could only be defined by an exhaustive analysis of so large a number of samples of real maple syrup, as should include with certainty all possible varieties of the article. As a matter of fact, the flavour-giving substances in maple syrup are not exactly known. It is probable that certain esters of malic and other acids, have most to do with maple syrup flavour. The acids in question yield calcium salts that are comparatively insoluble in dilute alcohol. Hence these acids can be determined with considerable exactitude.

The so-called *malic acid value* has been determined upon a large number of samples of presumably genuine maple syrup. Bulletin No. 134 of the Bureau of Chemistry, Washington, contains a report of work done upon 86 samples of Canadian maple syrup, obtained in Quebec, in 1909, and believed to be genuine.

The following are the results obtained:—

	Per cent.
Malic acid value from 0·30 to 0·39	1·2
" " 0·50 to 0·59	9·3
" " 0·60 to 0·69	10·4
" " 0·70 to 0·79	33·7
" " 0·80 to 0·99	34·9
" " 1·00 to 1·24	10·4

The same publication reports this determination upon a total of 480 samples obtained in the eastern United States and Canada, and believed to be genuine.

The percentage results are as follows:—

	Per cent.
Malic acid value from 0·00 to 0·29	0·2
" " 0·30 to 0·39	0·4
" " 0·40 to 0·49	2·3
" " 0·50 to 0·59	6·0
" " 0·60 to 0·69	12·3
" " 0·70 to 0·79	18·3
" " 0·80 to 0·99	34·1
" " 1·00 to 1·24	21·2
" " 1·25 to 1·49	4·8
" " 1·50 to 1·75	0·4

The tables accompanying this report give the malic acid values of 452 samples of maple syrup, each sample supplied by the maker, and accompanied by a declaration of its having been made entirely from maple sap. For purpose of comparison with the above, I submit the following synopsis of results, and may add that these have been obtained by methods of analysis, identical with those employed at Washington.

	Per cent.
Malic acid value below 0·30	None
" " 0·30 to 0·39	2·0
" " 0·40 to 0·49	4·0
" " 0·50 to 0·59	10·6
" " 0·60 to 0·69	15·7
" " 0·70 to 0·79	20·8
" " 0·80 to 0·99	37·8
" " 1·00 to 1·16	9·1

A malic acid value of between 0·50 and 1·00 is found for 88 per cent of Canadian samples, analyzed at Washington, for 71 per cent of samples obtained throughout Canada and the eastern United States; and for 94 per cent of Canadian samples herein reported, and furnished with a declaration of genuineness. It is safe to infer that samples giving less than 0·5 or more than 1·0 as malic acid values, are exceptional. But it must be borne in mind that individual samples, guaranteed genuine, give as low a malic acid number as 0·30; while 2 per cent of the present collection gave malic acid values below 0·4.

While the data available do not enable me to assert the fact positively, I am convinced that the sap from the soft maple produces a syrup yielding a lower malic acid number than that from the hard maple (rock maple). In many cases the sugar orchards contain both hard and soft maple trees; and I think it generally true that the hard maple predominates in the province of Quebec; and the soft maple in Ontario, particularly in western Ontario.

When the basic acetate of lead is added in excess to a solution of maple syrup (or sugar) malate of lead is thrown out of solution, together with other organic matters of varied character. If a lead solution of definite strength is employed, and the operation carried out under strictly defined conditions, this precipitate is found to be fairly constant in amount. Two recognized methods of making the test are widely used, and are as follows:—

Canadian method.—Five grammes (5) of sugar (or its equivalent in syrup) is dissolved in water, to a volume of 20 cc. Two (2) cc's of a solution of subacetate of lead is added, and the solutions thoroughly mixed. After standing for two (2) hours, the precipitate is filtered off, using a Gooch crucible or a sugar tube packed with asbestos, and washed four or five times with hot water, using the suction pump, dried and weighted. The weight of the dried precipitate in grammes in multiplied by 22·22.[1] The product is the *lead subacetate number*.

Mode of preparation of solution of subacetate of lead, as follows:—

Boil for half an hour 430 grammes of normal lead acetate and 130 grammes of litharge with 1,000 cc. water. Cool the mixture, allow to settle, and dilute the supernatent liquid to 1·26 specific gravity.

Winton method.—Weigh 25 grammes of the sample and transfer to a 100 cc. flask with water.[2] Add 25 cc. of the standard lead acetate solution and shake; fill to the mark, shake, and allow to stand at least three hours before filtering. From the clear filtrate, pipette off 10 cc. to a 250 cc. beaker, add 40 cc. of water and 1 cc. of concentrated sulphuric acid; shake and add 100 cc. of 95 per cent alcohol. Let stand over night, filter on a tared Gooch crucible, wash with 95 per cent alcohol, dry in a water oven, and ignite over a Bunsen burner, applying the heat gradually at first. Cool and weigh. Subtract the increase weight of lead sulphate from the weight of the blank and multiply by the factor 27·325. The determination of the blank is made as follows:—

Transfer 25 cc. of the standard lead acetate solution to a 100 cc. flask, add a few drops of acetic acid, and make up the whole to the mark with water. Shake, and use 10 cc. for the determination of lead, as directed in the preceding section, and multiply by the factor 27·325.

$$PbSO_4 \times \cdot 6829 \times \frac{100}{2 \cdot 5} = PbSO_4 \times 27 \cdot 325.$$

While the lead numbers found by the two methods are not identical they are comparable, and yield practically the same information regarding the sample, as will be seen in the sequel. The Canadian method has the advantage of requiring less time

[1] On the assumption that maple sugar contains 10 per cent water.

[2] With either of these methods, if fermentation has taken place, the carbonic acid must be boiled off before adding the lead solution.

[3] The resultant is weight of metallic lead corresponding to 100 grammes of the sample. The proposed Canadian Standard is based on the dry solids of the sample.

and labour, and is therefore better suited to police work, At best both methods must be regarded as empirical, and exact duplication of results is not to be expected with either.

With every empirical method two sources of error must be recognized and allowed for, viz.: That due to our ignorance of the more or less variable substances estimated, and that due to the personality of the operator. In any attempt to interpret into actual operation a written description of such a method as is in question, it will be found that no two operators will secure absolutely concordant results. In order to ascertain the limits of unavoidable difference in result, the following samples were worked in duplicate, by different persons, the samples being so designated that the analyst could not know what actual sample he had in hand. The columns headed 1 and 2 give check results in the hands of the same analyst; columns headed 3 and 4 give the mean results as found by different analysts, working upon the same sample, without knowledge of the fact. The differences following each pair of columns headed 1 and 2 give the magnitude of the first sort of error above referred to; while the *difference of means*, gives the magnitude of the second source of error. The work was done with every possible care, by skilled analysts.

Lead Number (Canadian Method).

STUDY of Errors involved.

Sample.	First Operator.				Second Operator.				Difference of Means.
	1	2	Diff.	Mean.	1	2	Diff.	Mean.	
A	1·72	1·80	0·08	1·76	1·68	1·67	0·01	1·67	0·09
B	2·42	2·52	0·10	2·47	2·46	2·32	0·14	2·39	0·08
C	2·02	2·12	0·10	2·07	1·95	2·29	0·34	2·12	0·05
D	2·36	2·52	0·16	2·44	2·50	2·52	0·02	2·51	0·07
E	1·70	1·68	0·02	1·69	1·96	1·84	0·12	1·90	0·21
F	1·46	1·40	0·06	1·43	1·20	1·29	0·09	1·24	0·19
G	1·72	1·52	0·20	1·62	1·70	1·73	0·03	1·72	0·10
H	1·94	1·94	0·00	1·94	2·14	2·22	0·08	2·18	2·24
K	1·70	1·96	0·26	1·83	2·14	2·06	0·08	2·10	0·27
L	2·00	2·00	0·00	2·00	1·84	1·82	0·02	1·83	0·17
M	.....	.....	.....	1·83	.....	.....	.....	1·78	0·05
N	.....	.....	.....	2·11	.....	.....	.....	1·92	0·19
O	.....	.....	.....	1·89	.....	.....	.....	1·85	0·04
		Average 0·10				Average 0·09			0·13

NOTE.—The above results are stated on the weight of the syrup; not, as usual, on the weight of dry sugar contained therein.

From this study it is apparent that the results of work must not be interpreted closer than 0·20. That is to say, if we require a legal minimum lead precipitate number of 2·00, then this requirement must be held to be fulfilled if analysis gives 1·80; since an error amounting to the difference between the number found and that required inheres in the method of working.

When the Winton method of determining the basic lead number is employed, the results for duplicate estimations are decidedly closer. The following table gives duplicate results by both methods, and illustrates at once the amount of error inherent in each method, and the relation of the indications obtained by each.

Basic Lead Numbers.

COMPARISON of Canadian and Winton Methods.

Sample.	Canadian.			Winton.			Difference of Means.
	1	2	Mean.	1	2	Mean.	
1	3·65	3·50	3·57	2·35	2·42	2·38	1·19
2	2·89	3·08	2·99	2·34	2·29	2·31	0·68
3	3·41	3·41	3·41	2·29	2·34	2·31	1·10
4	3·35	3·67	3·51	2·36	2·36	2·36	1·15
5	3·29	3·02	3·16	2·29	2·29	2·29	0·87
6	2·95	3·33	3·14	2·23	2·33	2·28	0·86
7	2·89	3·23	3·06	1·99	1·98	1·98	1·08
8	3·06	3·13	3·09	2·04	2·04	2·04	1·05
9	2·67	2·54	2·60	2·31	2·31	2·31	0·29
10	2·88	3·01	2·95	2·29	2·24	2·26	0·69
11	2·17	2·25	2·21	2·13	2·23	2·18	0·03
12	2·70	2·79	2·74	2·38	2·25	2·31	0·43
13	3·55	3·71	3·63	2·10	2·10	2·10	0·53
14	3·21	3·24	3·22	2·17	2·25	2·21	1·01
15	3·15	3·06	3·10	2·14	2·19	2·16	0·94
16	3·11	3·14	3·12	2·32	2·28	2·30	0·82
17	2·85	2·79	2·82	2·17	2·18	2·17	0·65
18	3·59	3·29	3·44	2·08	2·08	2·08	1·36
19	3·17	3·40	3·28	2·32	2·36	2·34	0·94
20	3·19	3·06	3·12	2·31	2·36	2·33	0·79
21	3·19	3·01	3·10	2·25	2·25	2·25	0·85
22	3·06	3·06	3·06	2·23	2·26	2·24	0·82
23	3·67	3·73	3·70	2·25	2·25	2·25	1·45
24	3·46	3·78	3·62	2·15	2·15	2·15	1·47
			3·11			2·23	

Mean difference is 0·16 between duplicates. Mean difference is 0·04 between duplicates. Mean difference between readings is 0·88.

It thus appears that the mean error for the Canadian method is 0·16, while for the Winton method it is only 0·04. Against this must be set the fact that the average lead number for the latter method is only 2·23, as against 3·11; in other words, if the number 2·00 be taken as minimum lead number by the Canadian method, 1·43 would have to be taken as the equivalent minimum by the Winton method; and a recognized probable error of 0·04 affects the first decimal figure of such a standard. The fact is that while both methods possess value as serving to point out real differences in character between samples of maple syrup, neither method is sufficiently exact or is based upon sufficiently definite chemical reactions, to permit of safe interpretation within about one-tenth of the indication actually found.

Bulletin No. 134 of the Bureau of Chemistry, Washington, gives (pp. 75 and 76) the lead numbers for 86 samples of Canadian maple syrup (Quebec), as determined by the Winton method.

Maximum	3·92
Minimum	1·85
Average	2·55

For 481 samples of syrup, representing the maple belt of the United States and Canada, the numbers are as follows:—

Maximum	4·41
Minimum	1·76
Average	2·70

Forty-seven (47) samples of the present collection have been worked by the Winton method, with the following results:—

Maximum	2·38
Minimum	1·05
Average	1·75

It will be noted that these numbers are decidedly lower than the numbers found at Washington for the season 1909. While the data at my disposal are not sufficiently full to enable me to speak decisively, I am inclined to believe that the rapidly extending use of improved apparatus in evaporating the sap, increased care in collecting, storing and handling it, with the introduction of filters, clarifiers, &c., in processing, have much to do with the reduction of the lead number. Through improvements in manufacture, impurities which give dark colour and turbidity to the product, are removed; and it is fully ascertained that a large number of the 456 samples herein reported have been made by producers equipped with modern evaporators and other appliances. The lead numbers given may be regarded as characteristic for maple syrup of a very high grade, from the point of view of cleanliness. Whether or not modern refinements in manufacture tend to reduce the flavour believed to be characteristic of maple syrup, is a matter upon which I cannot express an opinion.

The lead number has been determined by the Canadian methods of working, upon 456 samples of maple syrup, obtained directly from the makers, under declaration of genuineness. The following is a synopsis of results:—

Lead Numbers, Canadian Method.

From	1	to	1·50	in 2	samples.
"	1·50	"	2·00	" 29	"
"	2·00	"	2·50	" 126	"
"	2·50	"	3·00	" 136	"
"	3·00	"	3·50	" 91	"
"	3·50	"	4·00	" 54	"
"	4·00	"	4·50	" 12	"
"	4·50	"	5·00	" 3	"
"	5·00	"	5·50	" 1	"
"	5·50	"	6·00	" 1	"
Above	6·00			" 1	"
			Total	456	"

Our standards for maple syrup, legalized under section 26 of the Adulteration Act, and in force since April, 1911, require a lead number of not less than 2·2, determined by this method of working. It has already been shown that a possible error of 0·2 inheres in the method, so that samples giving 2·0 must be held to fulfil the requirements of the standard. It will be seen that 31 samples, or 7 per cent of the entire collection, fall below the required number. Since these samples are furnished with a declaration of having been made entirely from maple sap, it is of importance to ascertain whether there is any danger of judging them to be adulterated under existing standards, when the whole results of analysis are taken into account.

In order to determine this, the following synopsis of results is given:—

No.	Lead Number		Dry Solids.	Malic Acid.	Ash.		Remarks.
	Canadian.	Winton.			Total.	Insoluble.	
8	1·66	1·16	67·48	0·47	.....	.....	Illegal.
11	1·51	1 08	65·06	0 36	0·71	0 19	"
20	1·61	.....	66·68	0·59	0 75	0·27	Doubtful.
33	1·78	1·28	65·74	0·64	0·72	0·31	Illegal.
78	1·77	1·27	69 78	0·65	0·85	0·19	"
108	1·89	1·26	68·87	0·88	0 97	0·40	Doubtful.
154	1·94	1·49	68·10	0·59	0·82	0·24	Pass.
169	1 77	1 27	70·02	0·80	0·78	0·23	Illegal.
176	1·47	1·05	68·88	0·57	0·78	0·21	"
179	1·98	1·48	67·75	0·78	.....	.....	Pass.
207	1 57	1·12	63·44	0·74	0·85	0·25	Illegal.
209	1·93	1 46	70·47	0·49	0·97	0·28	Pass.
225	1·72	1·24	64·80	0·60	0·84	0·24	Illegal.
237	1·82	1·31	67 52	0·58	0·78	0·27	"
241	1·63	1·17	64·79	0·55	0·75	0·12	"
242	1·37	1·09	66·83	.....	0·99	0·60	"
263	1·90	.....	68·48	0·51	0 74	0·22	Doubtful.
268	1·93	1·57	67·52	0·66	0·69	0·20	Pass.
278	1·88	.....	68·41	0·71	0·72	0·29	Doubtful.
281	1·66	.....	68·42	0·54	0·79	0·24	"
284	1·94	.....	69·10	0·68	0·76	0·28	Pass.
299	1·88	.....	67·97	0·84	0·74	0·26	Doubtful.
330	1·98	.....	68·85	0·71	0 75	0·24	Pass.
338	1·90	1·32	69·10	0·76	0·75	0·27	Doubtful.
343	1·86	.....	67·71	0·72	0·83	0·25	"
383	1·88	1·27	70·46	0·61	0·75	0 24	"
385	1·54	1·25	59·10	0·72	0·84	0·24	Illegal.
391	1·50	1·17	68·88	0 68	0·70	0·23	"
392	1 66	1·07	64·93	0·85	0·72	0·30	"
395	1·80	1·55	66·38	0·83	0·75	0·33	Pass.
426	1 53	1·25	67·51	0·72	0·70	0·25	Illegal.

If judgment were based upon the lead number as obtained by the Canadian method of working, and by this datum only, the whole of the above 31 samples would have to be declared illegal. Such a mode of judging would evidently be unfair, as all the evidence must be taken into account.

Winton lead number.—This has been shown to bear a ratio of $\frac{2}{3}\frac{2}{1}\frac{3}{1} = 0.71$ to the Canadian lead number; and, if we allow one-tenth for experimental error, the limit Winton number is 1·41.

Dry solids must reach 65 per cent.

Malic acid, by reference to the legal definition for maple sugar, must reach 0·4 per cent.

Total ash must be 0·5 per cent.

Insoluble ash, although not legally recognized as a datum, has been shown to reach 0·2 per cent in normal samples of maple syrup.

When every allowance is made for imperfection in data available, it is found that 15 samples must be declared illegal, under our present standards. It is, nevertheless, impossible for me to believe that these samples are actually adulterated. I have had correspondence with most of the makers of these samples, and am perfectly convinced of their integrity, and indeed of their earnest wish to assist the department in protecting the maple industry. One of them has recently sent me four samples of syrup (tabulated as A, B, C, D), from Wisbench, Lambton Co., and three of these give results

for 'lead number' which would classify them as illegal under present standards. Yet these samples are fully vouched for as genuine maple products, and from the sap of the hard maple only. They have evidently been made with great care, and it is probable that it is to the care taken in their manufacture that the exceptionally low lead numbers are to be ascribed.

It seems, therefore, to be quite well established that while the great majority of maple syrups yield lead numbers much exceeding 2·2, maple syrup of genuine character may occur yielding lead numbers, which for the Canadian method of working do not exceed 1·50, and for the Winton method, 1·10.

Perhaps the most satisfactory determinations which the analyst can make upon maple syrup, have regard to the mineral constituents. When the syrup is evaporated to dryness and burned, these remain as the *ash*, and are found to be chiefly carbonates of lime and potash, with varying amounts of phosphates, sulphates, silica, &c.

The determination of total ash must be made upon the clear syrup, after sufficiently prolonged standing to ensure the settling out of all suspended matters. If this condition be fulfilled, and care be taken to prevent reduction of the carbonate of lime to oxide, or to reconvert to carbonate before weighing, very satisfactory duplicate estimations can be obtained.

The ashing of maple syrup, or indeed of any substance containing large amounts of carbonaceous matter, must be performed with great care, or serious loss will result. The dried material is slowly charred, over a small flame, and the combustion completed in a muffle, and at as low temperature as possible.

Bulletin No. 134 of the Bureau of Chemistry, Washington, gives the total ash determinations (pp. 75 and 76) of 86 samples of Canadian maple syrup, obtained in the province of Quebec, and under conditions which make it probable that they must be regarded as genuine, in the sense of their being entirely the product of maple sap. Calculated to a dry basis these gave:—

Maximum total ash per cent	1·35
Minimum total ash per cent	0·77
Average	0·95

The figures for total ash obtained from 481 samples of maple syrup, representing all the maple-producing states of the Union, as well as Canada, are as follows:—

Maximum total ash per cent	1·68
Minimum total ash per cent	0·68
Average	1·02

The ash has been determined upon 115 samples of the 456 constituting this report, with the following results:—

Maximum total ash per cent	1·38
Minimum total ash per cent	0·69
Average	0·89

Not much importance can be attached to the maxima, nor even to the averages quoted above. The really important question for us is: What is the lowest percent-

age of ash that a genuine maple syrup can yield? So far as this work goes, and on the assumption that all the samples examined are genuine, we must expect as low as 0·69 per cent of ash (reckoned on the dry basis), in occasional samples of genuine maple syrup. That so low an ash percentage as this is quite exceptional appears from the following. Of 115 samples the—

Total ash per cent is below	0·70	in 1	sample.
" "	0·72	" 5	samples.
" "	0·74	" 9	"
" "	0·76	" 19	"
" "	0·78	" 22	"
" "	0·80	" 34	"

Insoluble ash.—This is essentially carbonate of lime, with traces of magnesia, iron, phosphates and silica. It has been generally regarded as an important datum in judging the genuineness of maple syrup. Work done in Washington (Bulletin 134, Bureau of Chemistry) gives, for 481 samples, as follows:—

Maximum insoluble ash per cent	1·01
Minimum insoluble ash per cent	0·23
Average	0·37

Of the 115 guaranteed samples now reported, the figures for insoluble ash are as follows:—

Maximum insoluble ash per cent	0·75
Minimum insoluble as per cent	0·12
Average	0·33

In this case, as with total ash, importance attaches mainly to the *minimum* number. That 0·12 per cent of insoluble ash is exceptionally low, appears from the following considerations.

Of 115 samples, very carefully ashed, we find:—

0·12 per cent insoluble ash in	1	sample.
0·14 " "	1	"
0·19 " "	3	samples.
0·20 " "	2	"
0·21 " "	4	"
0·22 " "	2	"
Below 0·23 " " we find	13	"
" 0·20 " " "	5	"
" 0·19 " " "	2	"

or 1·7 per cent of the number examined.

It would appear that in this datum, as in the case of basic lead numbers and malic acid numbers, improved modern methods of manufacture tend to reduce the number in question. It is further probable that the 0·20 represents the minimum insoluble ash of carefully made syrups, from normal sap. The case in which a lower number than 0·20 is found must be regarded as exceptional, although not necessarily untrue to name.

In determinations of ash it is important that any sugar crystallized out be redissolved before sampling; as it is found that mineral matters, and particularly lime and magnesia salts are carried down with the sugar crystals.

BULLETIN No. 228—EXAMINATION OF MAPLE SYRUP, SAMPLES SUPPLIED BY MAKERS UNDER DECLARATION OF GENUINENESS, SEASON 1911.

Date of Collection.	Nature of Sample.	No. of Sample.	Name and Address of Manufacturer.	Results of Analysis.									Remarks and Opinion of the Chief Analyst.
				Moisture.	Solids.	Lead Subacetate ppt.	Calculated on dry Substance. Lead Subacetate ppt.	Calculated on dry Substance. Malic Acid, Value.	Lead number, Winton Method.	Ash. Total.	Ash. Water Soluble.	Ash. Insoluble.	
1911.				p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	
Mar. 23	Maple Syrup	1	S. Sherwood, Ostrander, Ont..	31·32	68·78	1·76	2·55	0·75	.....	.....	.....	.....	
„ 30	„	2	—. Stewart, Farquhar, Ont...	33·24	66·76	1·48	2·22	0·61	.....	.....	.....	.....	
„ 30	„	3	W. J. Vance, Farquhar, Ont..	32·14	67·86	1·18	2·23	0·67	.....	0·78	0·49	0·29	
„ 30	„	4	A. Campbell, Farquhar, Ont..	33·78	66·26	1·44	2·17	0·58	.....	.....	.....	.....	
„ 30	„	5	Thos. Hunkin, Farquhar, Ont.	35·44	64·66	1·53	2·34	0·67	.....	.....	.....	.....	
„ 30	„	6	J. Stewart, Farquhar, Ont...	33·68	66·32	1·43	2·15	0·54	.....	0·79	0·42	0·37	
„ 30	„	7	Chas. Cann, Thames Road, Ont.	31·60	68·40	1·90	2·77	0·52	.....	.....	.....	.....	
„ 30	„	8	John Cann, Thames Road, Ont.	32·52	67·46	1·12	1·66	0·47	1·16	.....	.....	.....	Clarified with cream and skimmed. Illegal under present standards.
„ 30	„	9	Albert Hunkin, Thames Road, Ont.	32·14	67·86	1·62	2·38	0·45	.....	0·85	0·49	0·36	
„ 30	„	10	E. Stone, Thames Road, Ont..	32·48	67·52	1·78	2·63	0·36	.....	.....	.....	.....	Malic acid low.
„ 21	„	11	Wm. H. McAllister, Dutton, Ont.	34·94	65·06	0·99	1·51	0·36	1·08	0·71	0·52	0·19	Malic acid low. Sott maple sap. Illegal under present standards.
„ 30	„	12	W. E. Clark, Dutton, Ont ...	35·88	64·12	2·47	3·85	0·62	.....	.....	.....	.....	Excess water.
„ 30	„	13	John T. Graham, Dutton, Ont.	35·76	64·24	1·07	3·22	0·56	.....	.....	.....	.....	„
April 1	„	14	W. R. Pollard, Iona, Ont ...	37·14	62·86	2·41	3·87	0·98	.....	.....	.....	.....	„
Mar. 29	„	15	Alex. Lindsay, Holbrook, Ont.	32·68	67·32	1·48	2·19	0·32	.....	0·78	0·45	0·33	Malic acid low.

" 29	"		16	James Rettie, Norwich, Ont.	30·86	69·14	1·34	2·89	0·84					
April 5	"		17	George Griffin, Burgessville, Ont.	32·70	67·30	1·84	2·73	0·58					
Mar. 22	"		18	Fred Webb, Burgessville, Ont.	35·92	64·08	1·54	2·40	0·74					Excess water.
April 4	"		19	W. H. Dennis, Burgessville, Ont.	31·48	68·52	1·69	2·46	0·83					
" 6	"		20	H. A. Griswold, Burgessville, Ont.	33·32	66·78	1·08	1·61	0·59		0·75	0·48	0·27	Very carefully made.
" 8	"		21	James Dennis, Burgessville, Ont.	33·92	66·08	1·34	2·08	0·99					
Mar. 29	"		22	Cecil M. Dennis, Burgessville, Ont.	33·40	65·60	1·43	2·14	0·98					
April 8	"		23	Harry Morgan, Burgessville, Ont.	32·92	67·08	1·62	2·41	0·96					
Mar. 27	"		24	W. C. Topham, Burgessville, Ont.	35·10	64·90	1·33	2·04	1·16					
" 23	"		25	J. S. Stevens, Burgessville, Ont.	32·39	67·70	1·38	2·03	0·84		0·89	0·61	0·28	
" 30	"		26	J. B. McKillop, Wallacetown, Ont.	31·60	68·40	1·94	2·84	0·69		1·00	0·63	0·37	
" 25	"		27	Alex. Watson, Wallacetown, Ont.	31·46	68·54	2·13	3·10	0·92					
" 31	"		28	A. D. S. Macallum, Wallacetown, Ont.	35·38	64·62	1·83	2·83	0·61					
" 31	"		29	J. M. Graham, Wallacetown, Ont.	32·84	67·16	1·69	2·51	0·78					
" 25	"		30	A. J. Lunn, Wallacetown, Ont.	39·04	60·96	2·00	3·27	0·82					Excess water.
April 17	"		31	Jno. H. H. Sully, Metcalfe, Ont.	39·96	60·06	2·51	4·17	0·79					
" 18	"		32	Geo. Clark, Metcalfe, Ont.	33·24	66·76	1·74	2·60	0·70		0·90	0·54	0·36	
" 22	"		33	F. T. Latimer, Metcalfe, Ont.	34·26	65·74	1·17	1·78	0·64	1·28	0·72	0·41	0·31	Carefully skimmed, no other treatment. Illegal under present standards.
" 20	"		34	Clinton Jackson, Metcalfe, Ont.	33·26	67·74	2·18	3·31	0·74					
" 15	"		35	Alex. Latimer, Metcalfe, Ont.	30·94	69·06	1·94	2·80	0·57		1·07	0·57	0·50	
" 18	"		36	A. Mooris, Metcalfe	30·98	69·02	1·70	2·45	0·70					
" 15	"		37	D. L. Wilson, Metcalfe, On			1·90	3·17	1·00					Excess water.
" 15	"		38	Wm. Boyd, Metcalfe, Ont	35									"
" 20	"		39	Jno. Boyd, M			1·85	2·75				0·66	0·60	
" 15	"		40	S			1·75	2·63						
" 15	"		41	S. J				3·11	0·44					

BULLETIN No. 228—EXAMINATION OF MAPLE SYRUP, SAMPLES SUPPLIED BY MAKERS UNDER DECLARATION OF GENUINENESS, SEASON 1911.

Date of Collection.	Nature of Sample.	No. of Sample.	Name and Address of Manufacturer.	Results of Analysis.									Remarks and Opinion of the Chief Analyst.
				Moisture.	Solids.	Lead Subacetate ppt.	Calculated on dry Substance.		Lead number, Winton Method.	Ash.			
							Lead Subacetate ppt.	Malic Acid, value.		Total.	Water Soluble.	Insoluble.	
1911.				p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.		p. c.	
April 15	Maple Syrup.....	42	Alex. McGirr, Metcalfe, Ont..	32·66	67·34	1 39	2·06	0 89	.....	0 87	0·61	0·26	
" 15	"	43	David McKnight, Metcalfe, Ont.	36·32	63·68	1·70	2·66	1·03	.....	.....	.....	.....	Excess water.
" 27	"	44	Reuben Bennet, Canterbury, P.Q.	35·40	64 60	.....	3·28	0·85	.....	.....	.....	.....	
" 26	"	45	Allen Snelling, Canterbury, P.Q.	37·40	62·60	.....	3 83	1 15	.....	.....	.....	.....	Excess water.
" 26	"	46	W. Mayhew, Canterbury, P.Q.	38·10	61·90	.....	5·13	0·90	.....	.....	.....	.....	"
" 28	"	47	G. Cote, Martinville, P.Q....	33·08	66·92	.....	2·38	0·55	.....	.....	.....	.....	
" 22	"	48	E. Choquette, Abbotsford, P.Q.	37·22	62·78	...	3·27	0·79	.....	.....	.....	.....	Excess water.
May 4	"	49	J. E. Richardson, Stanstead, P.Q.	33 92	66 08	.....	4·24	0·56	.....	.....	.....	...	
April 22	"	50	Walter Hall, Stoke, P.Q. ...	33·48	66·52	.....	2·40	0·61	.....	0 85	0 54	0 31	
" 15	"	51	P. A. Chicoine, St. Dominique de Bagot.	33 80	66·20	....	2·91	0·53	.....	.....	.....	.....	
" 15	"	52	C. Bernier, St. Dominique de Bagot.	35·52	64·48	.....	3 41	0·60	....	.....	.....	.....	Excess water
Mar. 18	"	53	H. Barre, Rougemont, P.Q...	35·20	64·80	.....	3 64	0 50	.....	.....	.....	.....	
May 2	"	54	W. A. Carpenter, Stanstead, P.Q.	30 94	69 06	.....	2·95	0·40	.....	.....	.....	.....	
April 8	"	55	H. Bernard, St. Dominique de Bagot.	33·30	67 70	.....	3·78	0 79	.....	.....	.....	.....	

	28			56	L. Michon, Salvail La presentation, P.Q.	32·60	67·40		3·20	0·74						
	" 13			57	C. Fisk, Abbotsford, P.Q.	34·66	65·34		3·52	0·57						
				58	Henri Dubuc, North Hatley, P.Q.	31·30	68·70		3·67	0·85						
	April 29			59	P. Rodrique, Compton, P.Q.	32·30	67·70		3·29	0·84						
	" 13			60	W. B. Honey, Abbotsford, P.Q.	30·46	69·54		3·91	0·84						
	" 14	"		61	E. E. Buzzell, Abbotsford, P.Q.	34·90	65·10		3·44	0·84		0·95	0·57	0·38		
	" 22	"		62	Alph. Jilbert, Compton, P.Q.	26·52	73·48		2·80	0·99						
	" 29	"		63	S. Beauregard, Waterville, P.Q.	31·72	68·28		2·66	0·75		0·95	0·48	0·47		
	May 9	"		64	N. H. Moffatt, West Ely	33·31	66·69		3·43	0·78						
				65	C. Potvin, Lawrenceville, P.Q.	34·99	65·01		3·68	0·72						
				66	A. J. Brown, Lawrenceville, P.Q.	34·06	65·94		3·00							
	"			67	A. Blanchard, Lawrenceville, P.Q.	31·33	68·67		3·0							
				68	A. Westover, Sutton Junction, P.Q.	30·43	69·54		3·68							
				69	"	34·99	65·01		3·00	0·6						
				70	Sample No. 2, natural	33·17	66·83		2·69	0·69						
		"		71	" No. 2, refined	32·71	67·29		2·88	0·69						
		"		72	" No. 3, natural	33·62	66·38		4·09	0·79		0·99	0·54	0·45		
		"		73	" No. 3, refined	33·17	66·83		3·71	0·79						
	April 25	"		74	Victor Roberge, Lawrenceville, P.Q.	32·48	67·52	1·60	2·37	0·71						
	" 25	"		75	Ovide Roberge, Lawrenceville, P.Q.	30·45	69·55	1·67	2·40	0·69						
	" 25	"		76	Jos. Bourassa, Lawrenceville, P.Q.	31·33	68·67	1·62	2·36	0·57						
	" 11	"		77	Achille Lagrandeur, Lawrenceville, P.Q.	32·99	67·01	2·00	2·98	0·66						
	" 25	"		78	Louis J. Gagnon, Lawrenceville, P.Q.	30·22	69·78	1·24	1·77	0·65	1·27	0·85	0·66	0·19	Made with care. Illegal under present standards.	
	" 19	"		79	P. Leduc, Mont St. Hilaire, P.Q.	30·21	65·79	2·28	3·27	0·87						
	" 20	"		80	Euclide Tetrault, Le Debouli de St. Hilaire, P.Q.	31·36	68·64	2·07	3·02	0·81						

BULLETIN No. 228—EXAMINATION OF MAPLE SYRUP, SAMPLES SUPPLIED BY MAKERS UNDER DECLARATION OF GENUINENESS, SEASON 1911.

Date of Collection	Nature of Sample.	No. of Sample.	Name and Address of Manufacturer.	Results of Analysis.									Remarks and Opinion of the Chief Analyst.
							Calculated on dry Substance.			Ash.			
				Moisture.	Solids.	Lead Subacetate ppt.	Lead Subacetate ppt.	Malic Acid, value.	Lead number, Winton Method.	Total.	Water Soluble.	Insoluble.	
1911.				p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	
.....	Maple Syrup . . .	81	Isidore Dragon, St. Ours, P.Q.	30·71	69·29	2·45	3·54	0·75	.....	.....	.....	.....	
April 18	"	82	Trefle Anclair, Rochelle, P.Q.	31·83	68·15	2·27	3·33	0·80	.....	.....	...	....	
May 10	"	83	Jos. Morin, Valcourt, P.Q. ..	33·17	66·83	2·34	3·50	0·75	.....	.....	.....	.....	
April 13	"	84	Chas. E. Slack, Abbotsford, P.Q.	34·96	65·04	2·01	3·09	0·87	. ...	.....	.....	...	
" 20	"	85	Alfred Catry, St. Hilaire, Village, P.Q.	32·75	67·25	2·32	3·37	0·86	.....	.....	.....	..	
" 20	"	86	Isa. Gauthier, St. Hilaire Village, P.Q.	29·98	70·02	1·72	2·46	0·69	.....	.....	.....	..	
" 20	"	87	C. Charbonneau, St. Hilaire, P.Q.	30·21	69·79	2·28	3·27	0·84	.....	.....	.....	.....	
.....	"	88	J. Genest, St. Hilaire, P.Q.	32·75	67·25	1·90	2·83	0·75	.. ..	.....	.	....	
" 19	"	89	Mad. A. Anclaire, St. Hilaire Stn., P.Q.	31·33	68·67	1·42	2·07	0·52	.....	0·84	0·61	0·23	
" 4	"	90	Z. Anthier, Le Deloull, P.Q. .	29·76	70·24	1·78	2·53	0·75	.....	.....	..	.... .	
" 25	"	91	Jos. Reid, Lawrenceville, P.Q.	30·22	69·78	1·48	2·12	0·51	....	.....	.....	. ..	
..... .	"	92	A. Fontaine, Lawrenceville, P.Q.	31·85	68·15	1·60	2·35	0·68	.....	.....	.....	.....	
April 25	"	93	Jos. Roberge, Lawrenceville, P.Q.	33·62	66·38	2·11	3·18	0·61	.....	.....	.....	.....	
" 4	"	94	N. Guffin, St. Hilaire Village, P.Q.	31·85	68·15	2·00	2·93	0·89	.. ..	.....	.....	.. ...	

" 19	"	95	E. Auclair, St. Hilaire Stn., P.Q.	31 36	68 64	1·61	2 35	0 81							
" 19	"	96	P. Germain, Mont St. Hilaire, P.Q.	29·98	70·62	1·74	2·48	0 84							
" 19	"	97	Alph. Rainlette, Mont St. Hilaire, P.Q.	31 85	68 15	1·70	2 49	0·52							
	"	98	E. Pion, Mont St. Hilaire, P.Q.	29·98	70·02	2·05	3·00	0·85							
	"	99	Pierre Denis, Mont St. Hilaire, P.Q.												Sample lost.
" 22	"	100	F.J. Beckett, Orford, P.O., N.S	32·48	67·52	2 49	3·69	0·62							
" 24	"	101	B.F. Coats, Pr. S. Boy, Gould Station.	33·60	66·40	1·97	2 97	0·68							
	"	102	Neva Asker, Canterbury	31·85	68·15	1·30	2·11	0·66		0·84	0 49	0·35			From frozen sap.
	"	103	Jean Rodrique, Compton	32 48	67·52	1·49	2·21	0·89							
April 18	"	104	Cyprien Larivée, St. Hilaire Stn.	35·43	64·57	2·27	3·52	0·46							
" 18	"	105	Arnaud Renaud, St. Hilaire Stn.	28·84	71·16	1·75	2·46	0·57							
" 22	"	106	W. J. Draper & Sons, Compton, P.Q.	30·50	69·50	1·49	2·14	0·77							
" 22	"	107	Pierre Simoneau, Compton, P.Q.	30·67	69·33	1·88	2·71	0·43							
May 1	"	108	W. L. Wood, South Barnston, P.Q.	31·13	68·87	1·28	1 89	0 88	1·26	0·97	0·57	0·40			Second growth maples.
April 22	"	109	P. W. Baldwin, Stanstead, P.Q.	31·85	68·15	1·48	2·17	0·41							
" 21	"	110	Jno. F. Groom, Canterbury, P.Q.	32·25	67·75	1·71	2·52	0·56							
" 20	"	111	J. Laurier, St. Cyrille, D. W.	33·17	66·83	2 35	3·52	0 88							
" 24	"	112	D. Hebert, Drummondville, P.Q.	32·99	67·01	1·86	2·78	0·78							
" 14	"	113	Robt. Whitney, Abbotsford, P.Q.	31·59	68·41	1·65	2·41	0 67							
" 17	"	114	C. Chalifoux, Inglis Corners, P.Q.	31·59	68·41	1·56	2·28	0 67							
" 17	"	115	Asa Shepard, Frelighsburg, P.Q.	31·13	68·87	1·60	2·32	0·74							
" 17	"	116	E. S. Spencer, Hillside, P.Q.	32·94	67·06	1·51	2 25	0·64							
" 15	"	117	Nelson Domingue, Niles Corners, P.Q.	30·45	69 55	3·07	4·41	1·05							
" 20	"	118	H. Brown, Hillside, P.Q.	35·42	64·58	1·53	2·37	0·67							
" 21	"	119	O. C. Reynolds, St. Amands Centre, P.Q.	30·45	69·55	1·89	2·72	0 78							

BULLETIN No. 228—EXAMINATION OF MAPLE SYRUP, SAMPLES SUPPLIED BY MAKERS UNDER DECLARATION OF GENUINENESS, SEASON 1911.

Date of Collection.	Nature of Sample.	No. of Sample.	Name and Address of Manufacturer.	Results of Analysis.									Remarks and Opinion of the Chief Analyst.
							Calculated on dry Substance.			Ash.			
				Moisture.	Solids.	Lead Subacetate ppt.	Lead Subacetate ppt.	Malic Acid, value.	Lead number, Winton Method.	Total.	Water Soluble.	Insoluble.	
1911.				p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	
April 12	Maple Syrup.	120	Cezaric Choquette, Beloeil Village, P.Q.	32·75	67·25	1·98	2·94	0·77	.....	.....	.....	.....	
„ 22	„	121	Odilon Bureau, Compton, P.Q.	30·90	69·10	1·58	2·29	0·76	.....	.....	.....	.....	
„ 11	„	122	Alphonse Burelle, Beloeil Village, P.Q.	31·12	68·28	1·89	2·74	0·88	.....	.....	.....	.....	
„ 20	„	123	Harley R. Goodhue, Abbots Corners, P.Q.	30·00	70·00	2·32	3·31	0·74	.....	.....	.....	.....	
„ 21	„	124	Chas. Westover, Abbots Corners, P.Q.	32·72	67·28	1·79	2·66	0·71	.....	.....	.....	.....	
„ 25	„	125	Geo. Mitchell, Drummondville, P.Q.	31·12	68·88	2·74	3·98	0·79	.....	.....	.....	.....	
„ 25	„	126	B. Mitchell, Drummondville, P.Q.	31·35	68·65	2·45	3·57	0·73	.....	.....	.....	.....	
„ 15	„	127	Ernest Demers, St. Vict. d'Arthabaska.	33·60	66·40	1·65	2·48	0·82	.....	.....	.....	.....	
.....	„	128	Jos. Brisson, St. Helene de Chesler, P.Q.	30·90	69·10	1·79	2·59	0·62	.....	.....	.....	.....	
April 12	„	129	Jno. Poirier, St. Valier de Bulde., P.Q.	30·90	69·10	1·44	2·08	0·45	.....	.....	.....	.....	
„ 15	„	130	Onesime Boislard, St. Nobert d'Arthabaska, P.Q.	30·67	69·33	1·84	2·65	0·84	.....	.....	.....	.....	
.....	„	131	Phillipe Mathieu, St. Ours, P.Q.	32·94	67·06	1·84	2·74	0·90	.....	.....	.....	.....	
.....	„	132	Eustache Barette, Beloeil, P.Q.	32·25	67·75	2·66	3·93	0·85	.....	.....	.....	.....	
.....	„	133	Albert Lousiguart, St. Chris. d'Arthabaska, P.Q.	30·21	69·79	1·84	2·64	0·97	.....	0·97	0·70	0·27	
April 20	„	134	Alexis Ares, Waterloo, P.Q.	30·21	69·79	2·49	3·57	0·99	.....	.....	.....	.....	

13	"	.....	135	Geo. Roach, Abbotsford, P.Q.	34·99	65·01	2 31	3·55	0·95	.....	.....	.....	.....	
24	"	.....	136	W. H. Talbot, Warden, P.Q.	30·50	69·50	1·79	2·58	0·94	.....	.....	.....	.....	
" 20	"	.....	137	G. A. Talbot, Warden, P.Q.	29·54	70 46	2·00	2 84	0·88	.....	.....	.....	.....	
.....	"	.....	138	Fred. Whitehead, South Stukely, P.Q.	37·29	62·71	2·29	3·65	0·78	.....	.....	.....	.....	Excess water.
.....	"	.....	139	G. Williams, Fulford, P.Q.	30·90	69·10	1·80	2·60	0 84	.....	.....	.....	.....	
April 18	"	.....	140	Jos. Rainville, St. Anne, P.Q.	30·90	69 10	2·08	3·01	0·85	.....	.....	.....	.....	
" 21	"	.....	141	Ovida Ares, Waterloo, P.Q.	31·58	68·42	1 83	2·67	0·62	.....	.....	.....	.....	
" 22	"	.....	142	Byron Smith, South Roxton, P.Q.	33·39	66·61	1 65	2·48	0·70	.....	.....	.....	.....	
" 25	"	.....	143	Ludger Blanchard, Stukely, P.Q.	33·39	66·61	1·41	2·12	1·03	.....	.....	.....	.....	
May 3	"	.....	144	Jno. P. Dunn, Warden, P.Q.	32·49	67·51	2·19	3·24	0·84	.....	.....	.....	.....	
April 19	"	.....	145	N. Campbell, Waterloo, P.Q.	32·72	67·28	1·55	2 30	0·66	.....	.....	.....	.....	
" 25	"	.....	146	Wilfrid Marrois, St. Joachim Shefford, P.Q.	32·50	67·50	1·46	2·16	0·82	.....	.....	.....	.....	
" 20	"	.....	147	V. S. Mairs, Warden, P.Q.	35·88	64·12	2 13	3·32	1·03	.....	.....	.....	.....	Excess water.
" 15	"	.....	148	A. N. Booth, Waterloo, P.Q.	32·50	67·50	1·90	2·81	0·97	.....	.....	.....	.....	
" 27	"	.....	149	Jas. E. Lewis, Warden, P.Q.	32·48	67·52	2·50	3·70	0·97	.....	.....	.....	.....	
.....	"	.....	150	E J. Standish, Warden, P.Q.	33·62	66 38	1·64	2·47	0·84	.....	.....	.....	.....	
April 20	"	.....	151	Jos. Marquis, West Shefford, P.Q.	33·16	66 84	2·17	3·25	0·94	.....	.....	.....	.....	
" 28	"	.....	152	D. Ashton, Warden, P.Q.	31·12	68·88	1·64	2·38	0·78	.....	.....	.....	.....	
Mar. 29	"	.....	153	Cohoe Bros., New Durham, Ont.	33·39	66·61	1·41	2·12	0 78	.....	.....	.....	.....	
" 21	"	.....	154	Burt Kennedy, Ilderton, Ont.	31·90	69·10	1·26	1·94	0·59	1·49	0·82	0·58	0·24	Made with care.
.....	"	.....	155	Michael Deneen, Strabane, P.O., Ont.	34·52	65·48	2·47	3 77	0·93	.....	.....	.....	.....	
April 3	"	.....	156	David De Geir, Hannon, Ont.	32·99	67·01	2·76	4·12	0·73	.....	.....	.....	.....	
" 6	"	.....	157	Jos. O'Brien, Nilestown, Ont.	34·98	65·02	1·86	2·86	0·94	.....	.....	.....	.....	
" 6	"	.....	158	Henry Hart, Nileston, Ont.	31·36	68·64	1·41	2·06	0·65	.....	0·82	0·48	0·34	
Mar. 25	"	.....	159	R. M. Ecker, Binbrook, Ont.	35 00	65 00	1·87	2 88	0 70	.....	.....	.....	.....	

BULLETIN No. 228—EXAMINATION OF MAPLE SYRUP, SAMPLES SUPPLIED BY MAKERS UNDER DECLARATION OF GENUINENESS, SEASON 1911.

Date of Collection	Nature of Sample	No. of Sample	Name and Address of Manufacturer	Results of Analysis.									Remarks and Opinion of the Chief Analyst.
				Moisture.	Solids.	Lead Subacetate ppt.	Calculated on dry Substance.			Ash.			
							Lead Subacetate ppt.	Malic Acid value.	Lead number, Winton Method.	Total.	Water Soluble.	Insoluble.	
1911.				p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	
..	Maple Syrup	160	Judson Barlow, Binbrook, Ont.	33·39	66·61	2·29	3·44	0·73	.....	.....	.....	.....	
	"	161	Jno. Sanderson, Strubane, Ont.	32·25	67·75	1·68	2·48	0·79	.....	.....	.....	.....	
Mar. 0	"	162	D. J. McKillop, Wallacetown, Ont.	31·38	65·04	2·39	3·67	0·79	.....	.....	.....	.....	
.	"	163	L. L. Jenner, props., E.T. M. S. and Syrup Exchange, Sutton, P.Q.	30·90	69·10	1·57	2·27	0·56	.....	.....	.....	...	
.....	"	164	Jos. Bouchard.....	34·07	65·93	2·25	3·41	0·89	.....	.....	.....	.....	
April 19	"	165	I. W. Whitcomb, East Hatley, P.Q.	33·76	66·34	1·99	3·00	0·98	.....	.....	.....	.....	
.....	"	166	C. B. Welch, Franklin Centre, P.Q.	34·99	65·01	1·73	2·66	0·99	.....	.....	.....	.....	
April 14	"	167	F. E. Richardson, Ayers Cliff, P.Q.	32·48	67·52	2·04	3·02	0·75	.....	.....	.....	.....	
21	"	168	E. E. Temple, Brown Hill, P.Q.	34·96	65·04	1·88	2·89	0·92	.....	.....	.....	.....	
" 15	"	169	Claude E. Honey, Way's Mills, P.Q.	29·98	70·02	1·24	1·77	0·80	1·27	0·78	0·55	0·23	Made with care. Illegal under present standards.
" 15	"	170	Herbert Webster, Hatley, P.Q.	33·39	66·61	2·08	3·12	0·61	.....	.....	.....	.....	
" 18	"	171	Moise Vien, St. Antoine, P.Q.	33·16	66·84	2·18	3·26	0·63	...	....	.....	.....	
.....	"	172	W. D. Hamill, Covey Hill, P.Q.	32·49	67·51	2·55	3·78	0·53	.....	.....	....	.....	
.....	"	173	Wilfrid Payant, Russelltown Flats, P.Q.	32·48	67·52	2·34	3·47	0·48	.....	.....	.....	.....	

.....	"	....	174	Geo. Hawker, Wisbeach.....	30 21	69·79	1·58	2·26	0·73	.....	0 90	0·54	0 36		
April 18	"	..... .	175	R. Wilson, Franklin Centre..	31·36	68·64	1·58	2·30	0·58	.....	.....	. ...			
" 10	"	.....	176	J. Y. Williams, Wisbeach, Ont.	31·12	68·88	0·93	1·47	0·57	1·05	0·78	0·57	0·21	Hard maple only. Illegal und r present standards.	
" 14	"	.....	177	Alex. Leblanc, Katevale, P.Q.	32·72	67·28	1·84	2·73	0·95	.....	....	....			
" 15	"	.....	178	F.W. Duston, Ayers Cliff, P.O.	35·43	64·57	1·75	2·71	0·78	... .	.....	... .			
" 20	"	.....	179	A. Bryan, Hatley.....	32·25	67·75	1·34	1·98	0 78	1·48	.....	....			
" 1	"	.....	180	Herbert Fletcher, Nassagaweya, Ont.	35·89	64·11	1·81	2·82	0·88	.....	.....	... .	.....	Excess water.	
" 18	"	.....	181	Julien Tremblay, Franklin Centre.	29·54	70·46	1·86	2·89	0 79	.... .	.....	.....	.....		
" 18	"	.....	182	Laurent Prevost, Batram.....	31·13	68·87	1·52	2·21	0·77	... .	....	.....	..		
.....	"	.....	183	Robt. Lucas, Ormstown.....	28·17	71·83	2·40	3·34	0·68	.....	.....	.....	.....		
April 1	"	.....	184	Fred. Cadman, Arkona, Ont..	30·90	69·10	2·00	2·95	0·84	.....	0·94	0·64	0·30		
Mch. 29	"	.....	185	Floyd Smith, Arkona, Ont...	30 90	69·10	1·91	2·76	0 88	.....	0 90	0·54	0·36		
.....	"	.....	186	Ed. R. Lowder, Geraldine, P.Q.	31·12	68·88	1 49	2·16	0 79	.....	0 85	0·54	0·31		
April 18	"	.....	187	P. B. Vallancourt, Franklin Centre.	32·25	67·75	1·59	2·35	0·95	...	0·87	0 60	0·27		
Mch. 28	"	..... .	188	G. Kingsbury, Nassagaweya, Ont.	29·98	70·02	2·11	3·01	0 95	.....	1·02	0·54	0·48		
" 31	"	.....	189	Thos. Richardson, Nassagaweya, Ont.	38·59	61·41	1·91	3·11	1·00	.....	0·91	0·54	0·37	Excess water.	
April 1	"	... .	190	John Locker, Knatchbull, Ont	32·48	67·52	1·80	2·67	0·74	... ..	0·91	0·55	0·36		
Mch. 31	"	... .	191	C. A. Darby, Knatchbull, Ont	31 81	68·19	1 51	2·21	0·55	.....	0·81	0·52	0·29		
" 24	"	.....	192	Will. J McKenzie, Arkona, Ont.	31·58	68·42	2·00	2·92	0·64	.....	.....	.....	.....		
April 10	"	.....	193	W. J. Pym, Anderson, Ont..	29·99	70 01	1 79	2·56	0·92	.....	1·03	0·66	0·37		
Mch. 25	"	.....	194	J. T. Muxlow, Arkona, Ont..	30·90	69·10	2·48	3·59	0·70	.....	1·14	0·72	0·42		
" 29	"	.....	195	Carl Smith, Arkona, Ont.....	30·21	69·79	1·71	2·45	0·68	.....	0·96	0·72	0·24		
" 30	"	.....	196	G. H. Snyder, St. Ann's, Ont.	32·25	67·75	1·87	2·76	0·70	.....	.....	.....	... ..		
" 31	"	.....	197	Alfred Taylor, St. Ann's, Ont.	30·32	69·78	2·22	3·18	0·72	.....	.....	.....	.....		
" 24	"	.....	198	F. Langan, Arkona, Ont.....	.....	.....	.....	.. ....	.....	.....	.....	.....	.....	Sample lost.	
" 25	"	.....	199	S. S. Smith, Arkona, Ont....	29·98	70·02	2·02	2·89	0·64	.....	.....	.....	.....		

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Date of Collection.	Nature of Sample.	No. of Sample.	Name and Address of Manufacturer.	Results of Analysis.									Remarks and Opinion of the Chief Analyst.
				Moisture.	Solids.	Lead Subacetate ppt.	Calculated on dry Substance.		Lead number, Winton Method.	Ash.			
							Lead Subacetate ppt.	Malic Acid, value.		Total.	Water Soluble.	Insoluble.	
1911.				p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	
April 15	Maple Syrup.....	200	Jas. Purvis, Felton, Ont.	37·01	62·99	2·40	3 81	0·93	.....	.....	.....	.....	Excess water.
" 15	"	201	Jno. C. Low, Vernon, Ont...	32·72	67·28	2·00	2·97	0 60	.....	.....	.....	.....	
" 11	"	202	Alfred Ross, Russelldale, Ont.	38·58	61·42	1·69	2·75	0·66	.....	.....	.....	....	Excess water.
" 15	"	203	Hector Craig & Sons, Kenmore, Ont.	31·13	68·87	1·52	2·20	0·62	.....	.....	.....	.....	
.....	"	204	T. H. Fuller, Watford.	33·62	66 38	1·56	2·35	0·48	.....	.....	.....	.....	
April 14	"	205	Herbert Yull, Kirkton, Ont..	30·90	69·10	2·01	2·91	0·74	.....	.....	.....	.....	
.....	"	206	M. Brooks, Alberton, Ont....	37·01	62·99	2·08	3·30	0·71	.....	.....	.....	....	Excess water.
.....	"	207	Wilfrid Larose, Angers, P.Q.	36·56	63·44	0·89	1·57	0·74	1·12	0·85	0·60	0·25	Excess water. Illegal under present standards.
Mar. 26	"	208	J. B. Zimmerman, Silverdale, Ont.	32·71	67·29	1·74	2·59	.....	.....	1·03	0·78	0·25	
April 22	"	209	Simeon Joanis, Angers. P.Q..	29·53	70·47	1·36	1 93	0·49	1·46	0·97	0 69	0·28	
.....	"	210	A. C. Krause, Jerseyville.....	32·48	67 52	1·92	2·84	0·56	.....	0·93	0·57	0·36	
Mar. 26	"	211	Wm. Marshall, Arkona, Ont..	32·48	67·52	1·99	2·81	0 88	.....	0·91	0·45	0·46	
April 18	"	212	E. W. Acres, Vernon, Ont. ..	34·52	65·48	1·69	2·58	0·84	.....	0·85	0·41	0·44	
" 11	"	213	Ed. Hanson, Russelldale, Ont.	33·86	66·74	1·38	2·08	0·84	.....	0 81	0·43	0·38	

" 15	"	214	W. E. R. Stanley, North Osgoode, Ont.	33·62	66·38	3·14	4·73	1·11	.....	1·30	0·57	0·73			
" 20	"	215	Ed. Ferguson, Anderson, Ont.	32·48	67·52	1·89	2·80	0·79	.....	0·97	0·76	0·21			
Mar. 31	"	216	Jno. Harcourt. St. Ann's, Ont.	32·02	67·98	2·35	3·46	0·69	.....	1·02	0·66	0·36			
" 15	"	217	W. A. Scharfe, Templeton, P.Q.	33·63	66·37	2·17	3·27	0·83	.....	1·05	0·64	0·41			
April 13	"	218	J. M. Snyder, St. Ann's, Ont.	31·12	68·88	2·00	2·90	0·50	.....	0·99	0·72	0·27			
" 13	"	219	E. Lane, Silverdale, Ont	37·63	62·37	1·54	2·47	0·72	.....	.....	.....	.....	Excess water.		
Mar. 28	"	220	W. M. Zimmerman, Smithville, Ont.	32·29	67·71	1·75	2·58	0·70	.....	.....	.....	.....			
" 30	"	221	Thos. Cosby, St. Ann's, Ont.	30·44	69·56	1·67	2·40	0·87	.....	.....	.....	.....			
April 13	"	222	J. A. Davis, Fallowfield, Ont.	37·01	62·99	1·55	2·46	0·57	.....	.....	.....	.....	"		
" 13	"	223	Jas. Shaw, South Gloucester, Ont.	35·65	64·35	1·81	2·81	0·86	.....	.....	.....	.....	"		
" 22	"	224	Daniel McDonald, North Osgoode, Ont.	.....	.....	.....	.....	.....	.....	.....	.....	.....	Sample lost.		
" 15	"	225	Ed. Laurin, Gatineau Point..	35·20	64·80	1·12	1·73	0·60	1·24	0·84	0·60	0·24	Illegal under present standards.		
" 18	"	226	Jas. York, Springhill, Ont...	32·26	67·74	2·47	3·65	0·51	.....	1·11	0·61	0·50			
" 15	"	227	Jas. A. Baragar, Felton, Ont..	37·01	62·99	2·62	4·16	0·98	.....	.....	.....	.....	Excess water.		
" 15	"	228	Ed. York, North Osgoode, Ont.	33·84	66·16	2·62	3·96	0·89	.....	.....	.....	.....			
Mch. 31	"	229	S. S. Vansickle & S. E. Drape, Jerseyville, Ont.	34·07	65·93	1·65	2·50	0·80	.....	.....	.....	.....			
.....	"	230	Edwin Vansickle, Jerseyville, Ont.	31·12	68·88	2·01	2·92	0·85	.....	.....	.....	.....			
April 13	"	231	H. H. Hitchcock, Silverdale, Ont.	32·45	67·52	1·35	2·00	0·88	.....	.....	.....	.....			
" 3	"	232	Addison Embury, Jerseyville, Ont.	31·38	68·42	1·98	2·90	0·61	.....	.....	.....	.....			
" 13	"	233	Rufus Grey, Greely, Ont.	37·46	62·54	2·37	3·79	0·95	.....	.....	.....	.....	Excess water.		
" 3	"	234	W. T. Howell, Capetown, Ont	30·22	69·78	2·09	3·00	0·83	.....	.....	.....	.....			
" 20	"	235	Silas Lennox, North Osgoode, Ont.	30·44	69·56	3·10	4·46	0·70	.....	.....	.....	.....			
Mch. 24	"	236	Wm. Yule, Kirkton, Ont. ...	32·26	67·74	1·46	2·15	0·83	.....	.....	.....	.....			
April 4	"	237	Wilbert Book, Jerseyville, Ont	32·48	67·52	1·23	1·82	0·58	1·31	0·78	0·51	0·27	Made with great care. Illegal under present standards.		
Mch. 28	"	238	A. H. Schnick, Smithville, Ont	31·13	68·87	2·00	2·90	0·77	.....	.....	.....	.....			

BULLETIN No. 228—EXAMINATION OF MAPLE SYRUP, SAMPLES SUPPLIED BY MAKERS UNDER DECLARATION OF GENUINENESS, SEASON 1911.

Date of Collection.	Nature of Sample.	No. of Sample.	Name and Address of Manufacturer.	Results of Analysis.									Remarks and Opinion of the Chief Analyst.
				Moisture.	Solids.	Lead Subacetate ppt	Calculated on dry Substance.		Lead number, Winton Method.	Ash.			
							Lead Subacetate ppt.	Malic Acid, value.		Total.	Water Soluble.	Insoluble.	
1911				p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	
April 3	Maple Syrup	239	Roy E. House, Ancaster, Ont.	32·94	67·06	1·75	2·61	0·78	.....	.....	.....	.....	
.....	"	240	Thos. C. Wilson, Jerseyville, Ont.	30·67	69·33	2·00	2·89	0·86	.....	.....	.....	.....	
Mch. 27	"	241	Ernie Patterson, Smithville, Ont.	35·21	64·79	1·06	1·63	0·55	1·17	0·75	0·63	0·12	Chiefly soft maple made with care. Illegal under present standards.
April 22	"	242	Aime Mongein, Angers, P.Q.	33·17	66·83	0·91	1·37	0·30	1·09	0·99	0·39	0·60	Illegal under present standards.
" 3	"	243	Wm. R. Kelly, Alberton, Ont.	33·85	66·15	2·10	3·18	0·68	.....	.....	.....	.....	
" 22	"	244	Robt. Henderson, Dalmeny, Ont.	33·39	66·61	2·37	3·56	1·06	.....	.....	.....	.....	
" 22	"	245	Thos. Barett, Cantley, P.Q.	37·45	62·55	3·54	5·66	1·04	.....	1·38	0·79	0·59	Excess water.
" 20	"	246	Walter Gowans, Anderson, Ont.	33·40	66·60	2·15	3·23	0·84	.....	.....	.....	.....	
" 22	"	247	Daniel Cameron, Springhill, Ont.	36·73	63·67	2·06	3·24	0·89	.....	.....	.....	.....	Excess water.
" 7	"	248	Lorne Book, Silverdale, Ont.	31·81	68·19	2·44	3·58	0·58	.....	.....	.....	.....	
" 20	"	249	M. E. Langford, Dunrobin, Ont.	32·26	67·74	2·59	3·82	0·81	.....	.....	.....	.....	
" 11	"	250	Cephas J. Drouin, Russelldale, Ont.	35·65	64·35	1·57	2·44	0·99	.....	.....	.....	.....	Excess water.
" 13	"	251	William Switzer, Anderson, Ont.	35·43	64·57	1·58	2·45	0·52	.....	.....	.....	.....	
" 13	"	252	Fred. Aubin, Gatineau Point.	35·88	64·12	1·92	3·00	1·01	.....	.....	.....	.....	Excess water

"	"	253	Francis Anderson, Kirkton, Ont.	30·90	69·10	1·40	2·03	0·56		0 79	0·50	0·29		
" 9	"	254	Isiah Booth, Foster, P.Q.	33·17	66·83	1·66	2·48	0·59						
" 20	"	255	Ernest Rollins, South Stukely, P.Q.	32·03	67·97	1·93	2·84	0·63						
" 20	"	256	D. M. Stewart, Dalmeny, Ont.	32·43	67·57	2·17	3·21	0·88						
	"	257	Robt. Hill, Richmond, Ont.	37·45	62·55	2·85	4·55	1·03					Excess water.	
April 19	"	258	Herman Bullis, Foster, P.Q.	32·48	67·52	1·74	2·58	0·85						
" 13	"	259	F. H. Wagener, Foster, P.Q.	34·07	65·93	1·41	2·14	0·80						
" 2	"	260	Abel Gould, Lombardy, Ont.	32·48	67·52	1·50	2·22	0·63						
" 3	"	261	Ed. J. Colquhoun, Russelldale, Ont.	34·29	65·71	1·45	2·21	0·60						
" 15	"	262	Jno. Kelland, Kirkton, Ont.	32·48	67·52	1·89	2·80	0·60						
" 14	"	263	Henry Page, Warden, Ont.	31·52	68·48	1·29	1·90	0·51		0·74	0·52	0·22		
	"	264	Geo. Boyer	30·44	69·56	2·40	3·54	0·70						
April 13	"	265	N. W. Chamberlain, West Bolton, P.Q.	30·20	69·80	1·61	2·35	0·87						
	"	266	Jno. Robert, South Stukely.	32·26	67·74	1·72	2·54	0·68						
	"	267	Henry Bissette, St. Ann's, P.Q.	32·03	67·97	1·95	2·87	0·63						
April 13	"	268	W. D. Inglis, Foster, P.Q.	32·48	67·52	1·30	1·93	0·66	1 57	0·69	0·49	0·20		
	"	269	F. S. Allen, South Stukely, P.Q.	32·72	67·28	1·97	2·93	0·60						
April 20	"	270	S. G. Bowker, Warden, P.Q.	30·90	69·10	1·81	2·62	0·56						
	"	271	L. J. Marsh, Sweetsburg, P.Q.	30·67	69·33	1·60	2·31	0·67						
April 22	"	272	H. A. Blunt, Knowlton, P.Q.	31·59	68·41	1·94	2·84	0·71						
" 11	"	273	" "	33·39	66·61	2·70	4·05	0·97						
	"	274	W. H. Knowlton, South Stukely, P.Q.	33·62	66·38	1·76	2·65	1·09						
	"	275	C. B. Benham, Sweetsburg, P.Q.	32·48	67·52	2·00	2·96	0·88						
	"	276	F. G. Johnston, West Bolton, P.Q.	31·59	68·41	1·62	2·37	0·97						
	"	277	E. A. Duboyce, Foster, P.Q.	56·56	63·44	1·91	3·0.	1·04					Excess water.	

BULLETIN No. 228—EXAMINATION OF MAPLE SYRUP, SAMPLES SUPPLIED BY MAKERS UNDER DECLARATION OF GENUINENESS, SEASON 1911.

Date of Collection.	Nature of Sample.	No. of Sample.	Name and Address of Manufacturer	Results of Analysis.									Remarks and Opinion of the Chief Analyst.
				Moisture.	Solids.	Lead Subacetate ppt.	Calculated on dry Substance.		Lead number, Winton Method.	Ash.			
							Lead Subacetate ppt.	Malic Acid, value.		Total.	Water Soluble.	Insoluble.	
1911.				p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	
April 12	Maple Syrup	278	Irwin Williams, Frost Village, P.Q.	31·59	68·41	1·28	1·88	0·71	.....	0·72	0·43	0·29	
" 10	"	279	H. E. Phelps, Foster, P.Q.	32·29	67·71	1·61	2·38	0·87	.....	.....	.....	.....	
" 20	"	280	Chas. Dempsey, Vernon, Ont.	31·21	68·19	1·77	2·60	0·37	.....	.....	.....	.....	
" 13	"	281	F. Desmarais, Warden, P.Q	31·58	68·42	1·06	1·66	0·54	0·79	0·55	0·24	.....	Clarified with eggs.
" 18	"	282	W. M. Witcher, West Bolton, P.Q.	31·12	68·88	2·61	3·79	0·88	.....	.....	.....	.....	
.....	"	283	M. F. Goddard, Waterloo, P.Q.	31·12	68·88	1·49	2·23	0·77	.....	.....	.....	.....	
April 2	"	284	C. F. Goddard, Foster, P.Q.	30·90	69·10	1·34	1·94	0·68	.....	0·76	0·48	0·28	
" 10	"	285	J. M. Sweet, Foster, P.Q.	31·58	68·42	2·13	3·11	0·86	.....	.....	.....	.....	
.....	"	286	W. J. Major, West Bolton, P.Q.	34·74	65·26	2·02	3·10	0·65	.....	0·96	0·51	0·45	
.....	"	287	Fred. Whitehead, South Stukely, P.Q.	34·97	65·03	1·53	2·35	0·75	.....	0·79	0·49	0·30	
April 26	"	288	Henry Goddard, South Stukely, P.Q.	31·12	68·88	2·28	3·31	0·76	.....	0·94	0·51	0·43	
" 28	"	289	W. R. Peters, South Stukely, P.Q.	33·40	66·60	1·98	2·97	0·79	.....	0·90	0·54	0·36	
.....	"	290	E. S. Hastings, Iron Hill, P.Q.	31·35	68·65	2·02	2·94	0·91	.....	1·00	0·45	0·55	
April 27	"	291	H. J. True, Frost Village, P.Q.	39·04	60·96	2·63	4·31	0·87	.....	1·08	0·33	0·75	Excess water.

" 19	"	292	C. A. Martin, Frost Village, P.Q.	30·67	69 33	1·53	2·21	0·58		0·93	0 63	0·30		
" 11	"	293	O. A. Bradley, West Bolton, P.Q.	32·12	67·74	1·60	2·36	0·59						
" 22	"	294	W. Dalpe, Iron Hill, P.Q.	34·78	65·22	1·89	2·90	0·64		0·90	0·54	0·36		
" 18	"	295	P. Dunlavey, West Shefford, P.Q.	32·71	67·29	1 63	2 42	0 92		0·78	0·51	0 27		
" 26	"	296	P. Dunlavey, West Shefford, P.Q.	33·62	66 38	1·76	2·65	0 82						
" 25	"	297	Asa A. Johnson, Cowansville, P.Q.	31·35	68·65	1 40	2 04	0·96						
" 14	"	298	N. G. Davis, Glen Sutton, P.Q.	30·90	69·10	1·66	2·40	0·84						
" 18	"	299	P. Dunlavey, West Shefford, P.Q.	32·03	67·97	1·28	1·88	0 84		0·74	0·48	0 26	Hard maple sap.	
	"	300	Geo. Fortin, Waterloo, P.Q.	32 03	67·97	1·91	2·81	0·89						
" 12	"	301	T. G. Sweet, Gilman, P.Q.	31·81	68·19	1·78	2·61	0·92		0·99	0·63	0·36		
	"	302	M. E. Owens, Brome, P.Q.	32 43	67·57	2·29	3·47	1·03		1·13	0·67	0·46		
April 14	"	303	Jas. S. Frizzle, Brome, P.Q.	31·59	68·41	1·84	2·69	0·86		0 91	0·51	0·40		
" 22	"	304	J. E. Jackson, Brome, P.Q.	30·90	69·10	1·80	2·61	0·86		0·97	0·63	0·34		
" 14	"	305	W. Dalpe Iron Hill, P.Q.	31·35	68·65	1·51	2·20	0·90		0·81	0 58	0·23		
" 22	"	306	" "	31·35	68·65	1·88	2·74	1·09		0·90	0 61	0·29		
" 18	"	307	J. & C. Hastings, Iron Hill, P.Q.	30·90	69·10	1·60	2 32	0·94		0·84	0·48	0·36		
" 14	"	308	J. T. Johnston, Brome, P.Q.	36·50	63·50	1·90	2·99	1 07		0·96	0·55	0 41	Excess water.	
" 15	"	309	Jas. S. Frizzle, Brome, P.Q.	32·48	67·52	2·26	3·35	0·94		0 91	0 54	0·37		
" 22	"	310	G. E. Vernal, Brome Centre, P.Q.	31·59	68·41	2·17	3·17	1 04		0·97	0·61	0·36		
" 15	"	311	T. G. Sweet, Gilman, P.Q.	33·16	66·84	1·94	2·90	0·91		0·90	0·51	0·39		
" 22	"	312	J. G. Edwards, Brome, P.Q.	33·16	66·84	2 47	3 70	0·96		1·08	0·48	0·60		
" 22	"	313	W. Dalpe, Iron Hill, P.Q.	32 62	67·28	1·83	2·72	0 84		0·87	0·54	0·33		
" 26	"	314	P. Dunlaney, West Shefford, P.Q.	35·43	64·57	1·82	2·82	1·02		0·87	0·45	0·42		
" 20	"	315	H. B. Bickford, Glenn Sutton, P.Q.	30·67	69·33	2·27	3·27	0·58		1·05	0·69	0·36		
" 10	"	316	L. A. Palmer, Sutton Junction, P.Q.	30·22	69·78	1·90	2·72	0·64						

BULLETIN No. 228—EXAMINATION OF MAPLE SYRUP, SAMPLES SUPPLIED BY MAKERS UNDER DECLARATION OF GENUINENESS, SEASON 1911.

Date of Collection	Nature of Sample.	No. of Sample.	Name and Address of Manufacturer.	Results of Analysis.									Remarks and Opinion of the Chief Analyst.
							Calculated on dry Substance.			Ash.			
				Moisture.	Solids.	Lead Subacetate test.	Lead Subacetate test.	Malic Acid value.	Lead number, Winton Method.	Total.	Water Soluble.	Insoluble.	
1911.				p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	
April 21	Maple Syrup	317	Asa Johnston, Cowansville, P.Q.	31·13	68·87	1·49	2·16	0·78		0·75	0·48	0·27	
" 15	"	318	J. G. Edwards, Brome, P.Q.	30·30	69·10	1·65	2·39	0·68		0·84	0·49	0·35	
" 21	"	319	A. J. Marsh, Sweetsburg	39·25	60·75	2·22	3·65	1·00		0·95	0·39	0·56	Excess water.
Mch. 30	"	320	J. G. Edwards, Brown's Corners.	31·57	68·43	1·62	2·37	0·70		0·87	0·55	0·32	
April 14	"	321	H. S. Vail, Brome, P.Q.	31·13	68·87	1·57	2·28	0·56					
" 8	"	322	A. J. Hawley, Sutton Junction, P.Q.	31·81	68·19	2·28	3·34	0·90					
	"	323	— Ryan, Sutton Junction, P.Q.	32·43	67·57	1·98	2·93	0·83					
April 21	"	324	Walter Tracy, Brome, P.Q.	31·35	68·65	1·75	2·55	0·81					
	"	325	" "	30·66	69·33	1·60	2·31	0·62					
" 21	"	326	Walter Tracy, Brome, P.Q.	30·90	69·10	1·66	2·40	0·87					
" 21	"	327	Taylor & Mason, Iron Hill, P.Q.	32·03	67·97	1·82	2·68	0·68					
" 21	"	328	C. C. Jenne, Brome, P.Q.	34·31	65·69	2·78	4·23	0·76					
" 18	"	329	E. W. Roy, Brome, P.Q.	30·20	69·80	2·21	3·17	0·79					
" 15	"	330	Jas. Patten, Brome, P.Q.	31·12	68·88	1·36	1·98	0·71		0·75	0·51	0·24	

" 2	"	351	J. & C. Hastings, Iron Hill, P.Q.	31·12	68·88	2·57	3·73	0·64						
" 8	"	332	J. H. Norton, Sutton Junction	32·71	67·29	1·89	2·81	0·74						
" 13	"	333	David Kirby, Brome, P.Q.	31·12	68·88	1·87	2·72	0·72						
" 19	"	334	E. Roy, West Brome, P.Q.	32·29	67·78	1·64	2·42	0·77						
" 17	"	335	Geo. H. Westover, East Hill, P.Q.	34·07	65·93	1·68	2·55	0·80						
" 19	"	336	Sherman Frizzle, Brome Centre.	33·90	66·10	2·28	3·45	0·59						
	"	337	Wood Kashan, West Brome.	32·48	67·52	1·94	2·87	0·85						
	"	338	Jno. Chamberlain, East Hill, P.Q.	30·90	69·10	1·31	1·90	0·76	1·32	0·75	0·48	0·27	Made with care.	
April 13	"	339	D. Hart, Sutton Junction	34·07	65·93	1·90	2·88	1·07						
" 12	"	340	S. A. Sweet, Sutton Junction.	30·90	69·10	1·80	2·60	1·09						
" 5	"	341	Nelson Mitchell, Molesworth. Ont.	31·58	68·42	2·35	3·43	0·77						
May 1	"	342	Alex. McKercher, Wroxeter, Ont.	32·63	67·97	1·83	2·69	0·91						
April 17	"	343	Geo. McDonald. Wroxeter, Ont.	32·29	67·71	1·34	1·86	0·72		0·83	0·58	0·25	Second growth maples.	
" 13	"	344	Arthur Hibbard, Sutton Junction, P.Q.	32·48	67·52	1·35	2·00	0·77		0·78	0·51	0·27		
" 10	"	345	E. E. Farmer, North Sutton.	31·57	68·43	1·42	2·08	0·59						
	"	346	Walter H. Patch, Brome, P.Q.	30·90	69·10	1·71	2·48	0·89						
April 16	"	347	W. J. Brown, Dunbon, P.Q.	35·65	64·35	2·10	3·26	0·86					Excess water.	
" 7	"	348	Herbert Toof, Sutton Junction	31·13	68·87	2·65	3·85	0·91						
" 24	"	349	Fred Johnson, Brome Corners, P.Q.	33·84	66·16	1·56	2·36	0·63						
" 22	"	350	J. J. Emmerson, Sutton Junction.	30·90	69·10	1·80	2·61	0·60						
" 22	"	351	A. A. Methivia, East Hill, P.Q.	34·52	65·48	1·48	2·26	0·76						
	"	352	J. Page, Sutton Junction.	32·29	67·71	2·00	2·96	0·91						
	"	353	W. St. Martin, Brome, P.Q.	33·90	66·10	1·36	2·06	0·84						
April 14	"	354	C. E. Larocque, Glenn Sutton	37·90	62·10	2·08	3·35	1·04					Excess water.	
" 15	"	355	E. V. Farmer, Brome, P.Q.	32·62	67·28	1·70	2·53	0·99						

BULLETIN No. 228—EXAMINATION OF MAPLE SYRUP SAMPLES SUPPLIED BY MAKERS UNDER DECLARATION OF GENUINENESS, SEASON 1911.

Date of Collection.	Nature of Sample.	No. of Sample.	Name and Address of Manufacturer.	Results of Analysis.									Remarks and Opinion of the Chief Analyst.
				Moisture.	Solids.	Lead Subacetate ppt.	Calculated on dry Substance.		Lead number, Winton Method.	Ash.			
							Lead Subacetate ppt.	Malic Acid value.		Total.	Water Soluble.	Insoluble.	
1911.				p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	
April 10	Maple Syrup	356	Jos. Robinson, Molesworth, Ont.	32·98	67·02	2·29	3·42	1·15	.....	.....	.....	.....	
„ 14	„	357	W. Grainger, Molesworth, Ont	33·39	66·61	1·55	2·33	0·88	.....	.....	.....	.....	
„ 11	„	358	C. E. Richard, Brome, P.Q.	32·43	67·57	1·64	2·43	0·91	.....	.....	.....	.....	
„ 6	„	359	C. B. Moffatt, Wroxeter, Ont.	31·59	68·41	1·80	2·63	0·92	.....	.....	.....	.....	
„ 13	„	360	Stewart Bros., Molesworth, Ont.	37·46	62·54	1·59	2·54	1·05	.....	.....	.....	.....	Excess water.
„ 11	„	361	C. C. Jenne, Brome, P.Q.	32·26	67·74	2·10	3·10	0·93	.....	.....	.....	.....	
„ 21	„	362	C. C. Pope, Wroxeter, Ont.	30·20	69·80	2·60	3·72	1·03	.....	.....	.....	.....	
Mch. —	„	363	Jas. A. Edgar, Wroxeter, Ont.	33·17	66·83	2·27	3·40	1·03	.....	.....	.....	.....	
April 15	„	364	G. E. Vernal, Brome Centre, P.Q.	33·03	67·97	1·49	2·19	0·80	.....	.....	.....	.....	
„ 22	„	365	J. G. Edwards, Brome, P.Q.	31·12	68·88	1·50	2·18	0·86	.....	.....	.....	.....	
„ 21	„	366	E. M. Palmer, Brome, P.Q.	36·55	63·45	2·15	3·39	0·92	.....	.....	.....	.....	Excess water.
„ 12	„	367	David Kirby, Brome, P.Q.	37·45	62·55	1·67	2·67	1·05	.....	.....	.....	.....	Excess water
„ 21	„	368	Jas. S. Frizzle, Brome, P.Q.	31·12	68·88	1·88	2·73	0·98	.....	.....	.....	.....	
„ 21	„	369	J. T. Johnston, Brome, P.Q.	32·49	67·51	1·67	2·47	0·99	.....	.....	.....	.....	
„ 15	„	370	E. M. Palmer, Brome, P.Q.	34·29	66·71	1·45	2·21	0·94	.....	.....	.....	.....	

" 17	"	....	371	C. E. Richard, Brome, P.Q...	31·57	66·43	1·45	2·12	0·65	... ..	.. ..	.....	.....	
" 14	"	.....	372	David Kirby, Brome, P.Q....	33·84	66·16	1·82	2·75	0·81	.	.....	. .	.....	
" 10	"	.....	373	R. Sharpin, Wroxeter, Ont...	32·29	67·71	2·60	3·84	0·94	.....	.....	. ....	.....	
.....	"	.....	374	Russell Baihew, Coaticook....	32·48	67 52	1·55	2·30	0·97	.....	....	.....	.....	
April 24	"	.....	375	Chas. H. Smith, Hatley.....	30 90	69·10	1·45	2 10	0·81	.....	.....	.....	.....	
" 13	"	.....	376	R. G. Dunbar, Melboro.....	31·58	68·42	2·27	3·32	0·84	.....	.....	.....	.....	
" 11	"	....	377	Adam Budger, Melbourne Bridge, P.Q.	30·20	69·80	2·17	3·11	0·74	.. .	.....	.....	.....	
" 15	"	.....	378	Edmund Bosquet, St. Pie de Bagot.	32·98	67·02	2·74	4·09	1·10	....	.....	....	.... .	
" 14	"	.....	379	E. Gouriard, St. Hyacinthe, P.Q.	32·12	68·88	1·44	2·09	0·85	.....	.....	.....	.....	
" 22	"	.....	380	Oliver Martin, Katevale, P.Q.	30·20	69·80	1·61	2·31	0·75	.....	.....	.. ..	.....	
" 15	"	.....	381	Prosper Masson, St. Simon de Bagot.	31·35	68·65	1·71	2·49	0·91	.....	.....	.....	...	
.....	"	.....	382	C. O. Martin, Frost Village, P.Q.	30·90	69·10	1·61	2·33	0·79	.....	.....	.....	.....	
.....	"	.. ..	383	P. R. Peter, South Stukely...	29·54	70·46	1·32	1·88	0·61	1·27	0·75	0 51	0·24	
May 15	"	....	384	G. Beaupre, St. Hyacinthe, P.Q.	31·59	68·41	1·83	2·68	0·71	.....	.....	.....	.....	
April 18	"	.....	385	Pierre Cariere, Compton, P.Q.	30·90	69·10	1·32	1·70	0·72	1·25	0·84	0·60	0·24	Illegal under present standards.
" 24	"	.....	386	Curtis Morrison, Barnston, P.Q	34·75	65·25	1·80	2·77	0·70	.....	.....	.....	.....	
" 17	"	....	387	J. A. Wright, Melboro, P.Q..	32·48	67·52	1·87	2·77	0·87	.....	.....	.....	.....	
" 20	"	.....	388	Jno. Stalker, Kingsbury ...	31 13	68·87	1·58	2·30	0·75	.....	...	.....	.....	
.....	"	.....	389	W. B. Birch, Coaticook	32·94	67·06	1·41	2·10	0·89	.....	.....	.....	.. .	
April 10	"	.....	390	P. P. Fowler, Dublin.	30·67	69 33	1·96	2·83	0·87	.....	.....	.....	.....	
" 16	"	... .	391	Amedée Boivin, Coaticook....	31·12	68·88	1·03	1·50	0·68	1·17	0·70	0·47	0·23	Illegal under present standards.
May 6	"	.....	392	J. F. Parsons, Barnston, P.Q.	34·07	65·93	1·09	1·66	0·85	1·07	0·72	0 42	0·30	Made with great care. Illegal under present standards.
April 21	"	....	393	H. Webster, Hillhurst.... ...	35·44	64·56	2·34	3·63	1·09	.....	.....	.....	.....	
" 22	"	....	394	Xavier Fontaine, St. Pie de Bagot, P.Q.	33·16	66·84	1·92	2·87	0·91	.....	.....	.....	.....	
15	"	.....	395	W. Pocock, Hillhurst.... ...	33·62	66·38	1·19	1·80	0·83	1·55	0·75	0·42	0·33	Very carefully made.

BULLETIN No. 228—EXAMINATION OF MAPLE SYRUP, SAMPLES SUPPLIED BY MAKERS UNDERS DECLARATION OF GENUINENESS, SEASON 1911.

Date of Collection.	Nature of Sample.	No. of Sample.	Name and Address of Manufacturer.	Results of Analysis.									Remarks and Opinion of the Chief Analyst.
				Moisture.	Solids.	Lead Subacetate ppt.	Calculated on dry Substance.		Lead number, Winton Method.	Ash.			
							Lead Subacetate ppt.	Malic Acid, value.		Total.	Water Soluble.	Insoluble.	
1911.				p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	
April 21	Maple Syrup.....	396	John Stoddard, Magog.....	29·55	70·45	3·23	4·59	0·82	.....	1·19	0·66	0·53	
„ 22	„	397	D. Goyette, St. Valerien ...	31·13	68·87	3·28	3·31	0·85	.....	.....	.....	.....	
.....	„	398	C. R. Ruter, Smith's Mills, P.Q.	34·31	65·69	2·66	4·05	0·82	.....	.....	.....	.....	
April 15	„	399	David Kirby, Brome, P.Q	49·68	50·32	1·82	3·62	0·97	.....	.....	.....	.....	Great excess water.
„ 21	„	400	P. P. Brainard, Boynton, P.Q.	25·41	74·59	2·27	3·04	0·35	.....	1·04	0·54	0·50	Malic acid low.
„ 20	„	401	O. A. Brock, Glenn Sutton, P.Q.	29·99	70·01	1·71	2·44	0·68	.....	1·00	0·69	0·31	
„ 15	„	402	P. Bernier, St. Dominique de Bagot.	32·26	67·74	2·00	2·95	0·60	.....	.....	.....	.....	
„ 15	„	403	H. Chagnon, St. Hyacinthe, P.Q.	30·67	69·32	1·79	2·58	0·88	.....	.....	.....	.....	
„ 22	„	404	E. Westover, Brome, P.Q....	31·36	68·64	2·18	3·18	0·90	.....	.....	.....	.....	
.....	„	405	G. H. Gove, Smith's Mills, P.Q.	39·93	60·07	2·24	3·73	1·16	.....	.....	.....	.....	Excess water.
April 21	„	406	J. L. Harvey, Iron Hill, P.Q.	30·32	69·78	1·77	2·54	1·11	.....	0·99	0·63	0·36	
„ 21	„	407	J. W. Bremner, Boynton, P.Q	30·22	69·78	2·29	3·28	0·93	.....	.....	.....	.....	
„ 23	„	408	Edmond Vien, St. Thomas D'Aquint.	30·53	70·47	2·34	3·32	0·92	.....	1·14	0·69	0·45	
„ 19	„	409	C. R. Ruter, Smith's Mills, P.Q.	30·43	69·57	1·86	2·67	0·90	.....	.....	.....	.....	

" 21	"	.....	410	N. G. Danis, Glenn Sutto P.Q.	4	69·56	1·43	2·06	0·84	.....	0·90	0·69	0·21		
" 22	"	.....	411	C. E. Rhicard, Brome, P.Q.	12	68·88	2·14	3·11	0·85	.....	.....	.....	.....		
" 15	"	.....	412	Jos. Forward, Katevale, P.Q.	32·03	67·97	2·30	3·38	0·86	.....	.....	.....	.....		
" 19	"	.....	413	.....	34·52	65·48	1·88	2·87	0·97	.....	.....	.....	.....		
" 22	"	.....	414	Geo. J. Casavant, St. Pie de Bagot.	31·35	68·65	1·64	2·39	0·84	.....	.....	.....	.....		
May 1	"	.....	415	Clark Hall, Sweetsburg, P.Q.	32·48	67·52	2·55	3·78	0·74	.....	.....	.....	.....		
.....	"	.....	416	M. E. Owens, Brome, P.Q.	30·44	69·56	1·94	2·79	1·06	.....	.....	.....	.....		
.....	"	.....	417	Jos. Allaire, St. Ours, P.Q.	30·43	69·57	2·06	2·96	0·83	.....	.....	.....	.....		
April 19	"	.....	418	A. O. Bish, Glenn Sutton, P.Q.	30·90	69·10	1·44	2·08	0·78	.....	.....	.....	.....		
.....	"	.....	419	C. Cleche, Beauce, Sample 1	31·12	68·88	2·64	3·83	0·90	.....	.....	.....	.....		
.....	"	.....	420	" " 2	28 62	71·38	4 68	6·56	1·06	.....	.....	.....	.....		
.....	"	.....	421	" " 3	28·40	71·60	1·99	2·78	0·78	.....	.....	.....	.....		
April 20	"	.....	422	Blake & Son, South Stukeley	31·80	68·20	1·46	2·14	0·86	.....	.....	.....	.....		
" 1	"	.....	423	Inspector Talbot, No. 48331	30·44	69·56	1·54	2·21	0·76	.....	0·86	0·56	0·30		
" 1	"	.....	424	" " 48332	32·48	67·52	1·60	2·37	0·65	.....	.....	.....	.....		
" 1	"	.....	425	" " 48333	34·68	65·22	1·66	2·55	0·71	.....	.....	.....	.....		
" 1	"	.....	426	" " 48334	32·49	67·51	1·03	1·53	0·72	1·25	0·70	0·45	0·25	Illegal under present standards.	
" 1	"	.....	427	" " 48335	36·34	63·66	1·42	2·23	0·75	.....	0·76	0·54	0·22	Excess water.	
" 1	"	.....	428	" " 48336	29·99	70·01	1·56	2·23	0·90	.....	.....	.....	.....		
" 1	"	.....	429	" " 48337	31·84	68·16	2·38	3·60	0·94	.....	.....	.....	.....		
" 1	"	.....	430	" " 48339	33·16	66·84	1·67	2·50	1·02	.....	.....	.....	.....		
" 1	"	.....	431	" " 48340	31·59	68·41	1·67	2·44	1·06	.....	.....	.....	.....		
" 1	"	.....	432	" " 48341	31 57	68·43	1·72	2·51	0·86	.....	.....	.....	.....		
" 1	"	.....	433	" " 48342	31·80	68·20	2·22	3·25	0·77	.....	.....	.....	.....		
" 19		.....	434	Alph. Boullette, Mont St. Hilaire.	30·43	69·57	2·28	3·28	0·57	.....	.....	.....	.....		

BULLETIN No. 228—EXAMINATION OF MAPLE SYRUP, SAMPLES SUPPLIED BY MAKERS UNDER DECLARATION OF GENUINENESS, SEASON 1911.

Date of Collection.	Nature of Sample.	No. of Sample.	Name and Address of Manufacturer.	Results of Analysis.									Remarks and Opinion of the Chief Analyst.
				Moisture.	Solids.	Lead Subacetate ppt.	Calculated on dry Substance.		Lead number, Winton Method.	Ash.			
							Lead Subacetate ppt.	Malic Acid, value.		Total.	Water Soluble.	Insoluble.	
1911.				p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	p. c.	
April 12	Maple Syrup.....	435	Mr. Learie, L. Avenir.....	30·90	69·10	1·61	2·33	0·50	....	0·87	0·54	0·33	
Mch. 25	"	i.	G. H. Loosie, Burgessville, P.Q.	38·32	61·80	....	3·58	0·35	2·38	0·74	0·55	0·19	Excess water, malic acid low,
" 25	"	ii.	J. R. McGlease, Burgessville, P.Q.	34·40	65·60		2·98	0·39	2·31	....	...	...	Malic acid, low.
" 25	"	iii.	J. Jacques, Burgessville, P.Q.	33·82	66·18	....	3·41	0·43	2·31	0·75	0·51	0·24	
" 25	"	iv.	J. C. Skinner, Burgessville, P.Q.	35·68	64·32		3·51	0·40	2·36	.....	.....	.....	Excess water.
" 25	"	v.	H. A. Griswold, Burgessville, P.Q.	35·08	64·92	....	3·15	0·30	2·29	0·78	0·57	0·21	Malic acid, low,
" 25	"	vi.	Sydney Fiddy, Hallbrook, Ont	41·20	58·80	.....	3·14	0·44	2·28	....	...	....	Excess water.
" 25	"	vii.	W. Briggs, Hallbrook, Ont. ..	34·38	65·62	.....	3·06	0·32	1·98	0·70	0·56	0·14	Malic acid, low.
" 25	"	viii.	Elgin Birch, Hallbrook, Ont..	36·82	63·18	....	3·09	0·64	2·04	....	....	.....	Excess water.
" 25	"	ix.	Powley Addison, Hallbrook, Ont.	38·72	61·28		2·60	0·58	2·31	....	.....	.....	"
" 25	"	x.	Cecil Chambers, Hallbrook, Ont.	36·88	63·12	....	2·94	0·39	2·26	....	...	.....	"
" 25	"	xi.	Albert Rocket, Hallbrook, Ont	33·36	66·64	....	2·21	0·36	2·18	...	....	.....	Malic acid, low
" 25	"	xii.	J. R. Woodwin, Beaconsfield, Ont.	37·14	62·86	.	2·74	0·68	2·31	.....	....	.....	Excess water.
" 25	"	xiii.	Stephen Hopkins, Beaconsfield, Ont.	36·48	63·52	.....	3·63	0·53	2·10	....	....	....	"

" 25	"	xiv.	W. Potter, Beachville Road, Woodstock, Ont.	34·64	65·36		3·23	0·46	2·21					
" 25	"	xv.	Edwin Wand, New Durham, Ont.	32·86	67·14		3·10	0·44	2·16					
" 25	"	xvi.	J. E. Rice, New Durham, Ont.	35·22	64·78		3·13	0·54	2·30					
" 25	"	xvii.	J. Karn, Woodstock, Ont.	34·26	65·74		2·82	0·38	2·17	0 72	0·52	0·20	Malic acid, low.	
" 25	"	xviii.	E. T. Chambery, Oxford Centre, Ont.	28·14	71·82		3·44	0·47	2·08					
" 25	"	xix.	Fred. Hewitt, Zenda, Ont.	37·68	62·32		3·28	0·44	2·34				Excess water.	
" 25	"	xx.	R. Denver, Zenda, Ont.	37·44	62·56		3·13	0·64	2·33				"	
" 25	"	xxi.	W. Sager, Vandicar, Ont.	33·62	66·38		3·10	0·60	2·25					
" 25	"	xxii.	Ed. Reidhead, Eastwood, Ont.	37·44	62·56		3·06	0·51	2·24				Excess water.	
" 25	"	xxiii.	Luke Gilholm. Bright, Ont.	35·74	64·28		3 70		2·25				"	
" 25	"	xxiv.	W. Derbyshire, Norwich, Ont.	31·76	68·24		3·61		2·15					
Oct 10	"	A.	J. Y. Williams, Wisbeach, Ont.	33·17	66·83		1·91	0·63		0·92			Hard maple sap. See sample 176.	
" 10	"	B.	" "	30·44	69·56		1·85	0·57		0·83			Hard maple sap.	
" 10	"	C.	" "	31·36	68·64		1 38	0·56		0·85			"	
" 10	"	D.	" "	33·62	66·38		2·44	0 51		0·96			"