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The Connecticut Agricultural Experiment Station

NEW HAVEN, CONN.

ON

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BEING THE

Twenty-Fifth Report

ON

Food Products

AND

Thirteenth Report on Drug Products.

By E. M. BAILEY.

CONNECTICUT AGRICULTURAL EXPERIMENT STATION

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February, 1921.

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CONTENTS.

FOODS, ETC.

DRUGS, ETC.

The Twenty-fifth Report on Food Products and the Thirteenth Report on Drug Products, 1920.

By E. M. Bailey.

The inspection and analysis of foods, drugs and miscellaneous materials made by this station during the past year are presented in this report which marks the twenty-fifth year of food inspection and the thirteenth of drug inspection in this State. The study of methods for the determination of caffein, principally in tea, has been continued and a new proceedure devised for the rapid and accurate estimation of this constituent. An examination of laundry and toilet soaps has been made, and a number of new and interesting diabetic foods have been analyzed. A larger number than usual of alcoholic liquors have been tested, chiefly for wood alcohol, on account of the panic created by the sale of a quantity of "poison whiskey" the alcohol of which was found to be entirely methyl (wood) alcohol.

As for several years past the volume of work done for the Dairy and Food Commissioner has been relatively large. Milk, ice cream, carbonated beverages and drug preparations are the items of chief importance.

An exhibit showing different phases of the laboratory work was prepared as a part of the Station exhibit at the Farmers' Week Fair in Hartford; and a number of papers have been written for presentation at meetings of various associations.

Co-operation with the Association of Official Agricultural Chemists in the study of methods of analysis, with the American Medical Association on matters pretaining to diabetic foods and with the Society of Cotton Oil Chemists in the examination of check cottonseed meals and fertilizers has been continued.

Credit for the analytical work involved is due entirely to Messrs. Andrew, Shepard, Edmond, Nolan and Merwin. Mr. Andrew has shared with the writer much of the court work called for by the Dairy and Food Commissioner.

I. FOODS.

CARBONATED SOFT DRINKS, ETC.

One hundred and eighty-nine samples of soft drinks, cereal beverages, etc., have been submitted by the Dairy and Food Commissioner. They are grouped according to the examinations made of them as follows:

Examined for saccharin 131; saccharin detected in 53.
Examined for capsicum 44; capsicum detected or indicated in 43.
Examined for alcohol 14; alcohol found in excess of 0.5 per cent. in 10.

The presence of saccharin in any normal food constitutes adulteration in this State. Section 2438 of Chapter 128 of the General Statutes declares an article of food to be adulterated "if any substance has been mixed and packed with it so as to reduce or lower or injuriously affect its quality or strength." Also "if it contains any added poisonous or other added deleterious ingredient which may render such article injurious to health."

While beverages of the soda water type are not drunk primarily for their food value, they possess a food value by virtue of the sugars they contain. Saccharin has no food value but its sweetening power is about 500 times greater than that of ordinary sugar. The addition of saccharin necessarily reduces the food value of any article of food in which it is used as a substitute for sugar; and it is, moreover, a substance which may render food injurious to health.[1] In spite of the growing sentiment against this illegal sweetener among the better class of bottlers it is still used to a considerable extent in the State chiefly, if not entirely, by local establishments.

Saccharin was found in the following samples:

D. C. No.	Brand.		Manufacturer or Dealer.
15119	Strawberry Soda.	*Ansonia:*	Crystal Bottling Works.
17208	Lemon Soda.		G. Soventino.
17223	Cream Soda.	*Bridgeport:*	American Bottling Co.
17219	Cream Soda		Central New York Bottling Co.
17216	Cream Soda.		Gottlieb Luippold.
17221	Strawberry Soda.		Greater New York Bottling Co.
15123	Orange Soda.		Grey & Lights.
17231	Cream Soda.		Hallett Mineral Water Co.
17218	Cream Soda.		Standard Bottlings Works.
15122	Raspberry Soda.		West End Bottling Works.
17235	Raspberry Soda.		West End Bottling Works.
16188	Strawberry Soda.	*Bristol:*	Elco Beverage Co.
15385	Orange Soda.	*Danielson:*	H. B. Hargraves.

[1] Food Inspection Decision 142, U. S. D. A.

D. C. No.	Brand.		Manufacturer or Dealer.
16161	Strawberry Soda.	*Hartford:*	United Bottling Works.
16159	Strawberry Soda.		Anthony P. Zazzaro.
16160	Lemon Soda.		Anthony P. Zazzaro.
17779	Ginger Ale Soda.	*Jewett City:*	James Glorvacki.
17778	Strawberry Soda.		James Glorvacki.
17777	Ginger Ale Soda.		Peter Romanek.
17776	Strawberry Soda.		Peter Romanek.
17227	Cream Soda.	*Meriden:*	T. F. Lyons.
17205	Lemon Soda.	*Naugatuck:*	John Greene.
15596	Cream Soda.	*New Britain:*	S. F. Avery.
15593	Strawberry.		Eureka Bottling Co.
16152	Lemon Soda.	*New Haven:*	Atlantic Bottling Works.
16956	Ginger Ale Soda.		Clancy Bottling Works.
16952	Sarsparilla Soda.		Golden Eagle Bottling Works
16960	Ginger Ale Soda.		Hamilton Bottling Works.
16964	Lemon Soda.		Virginia Linauro Bottling Works.
16963	Soda.		Frank Mosca Bottling Works
16961	Lemon Soda.		New Haven Bottling Works.
15121	Lemon Soda.		Harry Owen.
16954	Cream Soda.		Shanbron Bottling Works.
17312	Ginger Ale Soda.		Smile Bottling Works.
17313	Cream Soda.		Smile Bottling Works.
16955	Orange Soda.		Yale Bottling Works.
18435	Ginger Ale Soda.	*Norwalk:*	Morris Slopshin.
18436	Strawberry Soda.		Morris Slopshin.
17244	Cream Soda.	*Norwich:*	D. A. Sullivan.
18438	Strawberry Soda.	*South Norwalk:*	Adolf Dreifuss.
17211	Lemon Soda.	*Stamford:*	Silver Springs Water Co.
17214	Strawberry Soda.		National Spring Water Co.
17329	Strawberry Soda.	*Stratford:*	George Bovodach & Steve Tomasco.
17330	Cherry Soda.		George Bovodach & Steve Tomasco.
18246	Strawberry Soda.	*Taftville:*	Albert LaBarre.
16191	Cream Soda.	*Thomaston:*	August Koegel.
15588	Strawberry Soda.	*Waterbury:*	Brass City Bottling Works.
15590	Strawberry Soda.		Brooklyn Bottling Works.
16200	Strawberry Soda.		J. A. Silver.
15390	Strawberry Soda.	*Willimantic:*	John Latusek.
16985	Lemon Soda.		John Latusek.
17201	Lemon Soda.		Mosca & Salvatore.
17203	Strawberry Soda.		Mosca & Salvatore.

Beginning January 1st, 1921, the presence of capsicum in ginger ale must be stated upon the label[1].

By official definition "ginger ale is the carbonated or artificially carbonated beverage prepared with potable water, acidulated sugar (sucrose) syrup, and ginger ale flavor," ginger ale flavor being the water-soluble product obtained from ginger, with or without flavoring substances which do not simulate the flavor or pungent effect of ginger.

"Ginger ale with capsicum is the carbonated or artificially carbonated beverage prepared with potable water, acidulated sugar (sucrose) syrup, and ginger ale with capsicum flavor," ginger ale with capsicum flavor being the water-soluble product obtained from ginger and capsicum, with or without other flavoring substances.

[1]F. I. D. No. 177.

The predominating flavor in both ginger ale and ginger ale with capsicum is that of ginger.

The beverage called ginger ale is said to have originated in England and the presence of capsicum in the formula appears to have been established by general use, its purpose being to add pungency to the product. Why the beverage should have been called ale is not apparent. It bears no resemblance to the product of that name prepared from malt and hops and is not fermented.

The method we have used for the detection of capsicum indicates the presence of capsicum or other pungent substances foreign to ginger[1]. By this method capsicum was indicated in the following samples:

D. C. No.	Brand.		Manufacturer or Dealer.
17222	Ginger Ale	*Bridgeport:*	American Bottling Works.
17215	Ginger Ale		Gottlieb Luippold.
17220	Ginger Ale.		Greater New York Bottling Co.
17232	First Prize		Grey & Light.
17230	Ginger Ale.		Hallett Mineral Water Co.
17217	Ginger Ale.		Standard Bottling Co.
17234	Ginger Ale.		West End Bottling Co.
17237	Ginger Ale.		Whistle Bottling Co.
16180	Ginger Ale.	*Bristol:*	Bristol Bottling Works.
16189	Ginger Ale		The Elco Beverage Co.
16186	Cascade		C. E. Perkins Bottling Works.
17252	Ginger Ale	*Central Village:*	U. LaFrance.
17250	Ginger Ale.	*Danielson:*	H. B. Hargraves.
16172	Ginger Ale.	*Hartford:*	Hartford Bottling Works.
17224	Hydrox.	*Meriden*	Charles N. Carroll.
17226	Sun Ray.		T. F. Lyons Co.
17204	Ginger Ale.	*Naugatuck:*	John Greene.
15597	Ginger Ale.	*New Britain:*	S. F. Avery.
15594	Ginger Ale.		Eureka Bottling Works.
15595	Ginger Ale.		William Naughton.
17242	Pequot Brand.	*New London:*	Bagdanowsky Bros.
16199	Ginger Ale.		Rich & Rubin.
17238	Ginger Ale.		Steam Bottling Works.
17247	Ginger Ale.		Chester Wright.
17243	Ginger Ale	*Norwich:*	Crystal Spring Co.
16183	Ginger Ale	*Portland:*	Portland Bottling Works.
17249	Ginger Ale.	*Putnam:*	Putnam Bottling Works.
17115	Ginger Ale.	*South Manchester:*	Manchester Bottling Works.
17213	Ginger Ale.	*Stamford:*	National Spring Water Co.
17210	Ginger Ale.		Silver Spring Water Co.
16190	Ginger Ale.	*Thomaston:*	August Koegel.
17228	Ginger Ale.	*Wallingford:*	R. S. Botsford.
16181	Ginger Ale.	*Middletown:*	Duchess Bottling Works.
15599	Arauna.		M. T. Fitzgibbons.
15587	Ginger Ale.	*Waterbury:*	Brass City Bottling Works.
15589	Ginger Ale.		Brooklyn Bottling Works.
16192	Ginger Ale.		Eagle Brewing Co.
16193	Ginger Ale.		Hamilton Bottling Works.

[1]A. O. A. C. Methods of Analysis, p. 206. 1919.

D. C. No.	Brand.		Manufacturer or Dealer.
16197	Ginger Ale.	*Waterbury:*	Mascola Bottling Works.
17209	Elco Ginger Paste.		Emil Moscola.
16198	Ginger Ale.		Reiner Bottling Works.
16196	Ginger Ale.		Yale Brewing Co.
16986	Ginger Ale.	*Willimantic:*	Willimantic Bottling Co.

Eight miscellaneous beverages, sodas, cordials, etc., were submitted for determinations of alcohol. All were found to contain alcohol in excess of 0.5 per cent., but as only one sample was submitted in the original unopened bottle the alcohol content as sold by the dealer cannot be stated. The one unopened sample was Cider soda, **16185,** which contained 1.19 per cent. of alcohol by volume. It was sold by the Bristol Bottling Works, Bristol.

Six cereal beverages were submitted, all in original unopened bottles. Palpha **17206,** Brooklyn Bottling Works, Waterbury, and Fingo **15383,** Worcester Brewing Corp., Worcester, Mass., contained 0.61 and 0.84 per cent. alcohol by volume respectively.

Beverages and Fruit Syrups Examined for Saponins.

The presence of foam producers in various soft drinks and in malt liquors has been reported or suggested in the literature. Preparations from soap bark and commercial saponin are used for this purpose but they are objectionable on account of the toxic principles they contain. Glycerrizin, the active principle of licorice, also serves to produce the desired foam.

Tests for saponins are summarized in Leach[1] and we have found them to work satisfactorily upon known saponin solutions. An old commercial preparation labeled "Soda Foam," which we had among our laboratory specimens and a water extract of soap bark responded positively to the tests there described. If glycerrizin is present or suspected the haemolysis test should be used. While it is generally best to extract the saponins and purify them before applying qualitative tests, suspicious samples may be sorted out by inducing foam directly in the solution by passing a current of air through it, collecting the froth and applying tests directly on the liquid formed when the foam subsides.

Six fruit syrups and three cereal beverages were examined for foam producers but negative results were obtained in all cases.

CEREAL PRODUCTS.

Breakfast Foods.

Two fruited cereal preparations have been analyzed. Fruited Wheat, **13973** and Fruited Oats, **13974**, a combination of figs, dates and raisins with wheat and oats respectively. Manufactured for the Fruited Cereal Co., Quincy, Ill.

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[1]Food Inspection and Analysis, p. 1016.

Analyses of these products are as follows:

Station No.	13973	13974
	%	%
Moisture	9.89	9.74
Ash	3.60	3.34
Protein	15.63	13.13
Fiber	2.42	1.30
Nitrogen-free extract	66.21	68.10
Fat	2.25	4.39

Health Foods.

Three products of this class have been examined.

Ry-Krisp, **14200**, made by the Original Ry-Krisp Co., Minneapolis, Minn. This preparation is stated in the advertising literature to be made from whole rye "without soda, baking powder, yeast, or any ferment, without sweetening, shortning, or flavoring except a little salt." It is also stated to contain "nine out of the eleven mineral elements (vitamines) necessary for the proper nourishment of the human body". So far as we know it has not been demonstrated that vitamines are mineral elements. A proximate analysis of the preparation is given which is substantially correct. It is not recommended as a diabetic food but its laxative properties are emphasized.

The product was submitted for examination with reference to its usefulness in a diabetic dietary. The analysis shows a normal amount of carbohydrate nearly one-half of which is starch. Its utility in a diabetic diet will depend entirely upon the tolerance of the patient.

Swedish Health Bread, **13628**, made by O. G. Petterson, Cambridge, Mass. Submitted for analysis by a diabetic patient.

Basy Bread, **14405,** made by Doctor's Essential Food Co., Orange, N. J. This is used as an anti obesity remedy. It is stated not to be a medicine or drug but a wholesome and delicious food scientifically prepared. Three slices per day are said to accomplish weight reduction.

The proximate analysis of this preparation is given below. It furnishes no clue of course to the alleged efficacy of the bread as a weight reducer. Having been advised that symptoms resembling those which follow the administration of thyroid had been observed after eating this bread, tests were made for iodine but none was detected. The method of Seidell[1] was employed and amounts up to 20 grams of bread were used. A commercial sample of desiccated thyroid gland[2] was tested by the same procedure and 0.2 per cent. of iodine found. When 10 milligrams of this thyroid preparation were added to 0.99 gm. of bread a positive test for iodine was obtained.

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[1]Jour. Biol. Chem., **3**, 391 (1917).
[2]Parke, Davis & Co.

We have since seen a discussion[1] of this product from which we quote.

"According to the manufacturers Basy Bread is made from coarse ground, hard whole wheat, preserved and sweetened with ground figs and containing vinegar, salt and water".

After giving analyses showing the composition of this bread as compared with average graham bread the discussion continues.

"The purchaser of Basy Bread finds that, in addition to eating the preparation for which he is paying $1.00 a loaf, it is also necessary to follow the 'Basy Bread' Diet. This diet is typical of those recommended in the reduction of fat".

By a simple experiment the user of this bread can test its efficacy for himself by adhering rigidly to the prescribed diet omitting the Basy Bread entirely and comparing the results with those obtained when it is included. We suspect that the diet has more to do with weight reduction than has the bread.

The analyses of these three preparations are as follows:

Station No.	14200	13628	14405
	%	%	%
Moisture	5.80	8.55	36.91
Ash	2.78	2.71	2.40
Protein	14.00	10.44	9.59
Fiber	1.34	1.82	1.85
Nitrogen-free extract:			
Starch	34.79	47.73	48.12
Other nitrogen-free extract	39.63	27.68	
Fat	1.66	1.07	1.13

Flour.

Four samples of flour were submitted by the Dairy and Food Commissioner and four samples were sent by individuals. Of the latter, Nos. **15167** and **15173** were represented to be largely gluten. Analyses showed them to contain 2.08 per cent. of nitrogen each which is about the nitrogen content of ordinary flour and much too low for gluten flour of standard quality which should contain not less than 7.1 per cent. of nitrogen on a water free basis or about 6.25 per cent. with the amount of moisture generally present in the market product.

The other samples require no comment.

CIDER.

Six samples were examined. Two, Nos. **18405** and **18424**, were sent by the Dairy and Food Commissioner and four, Nos. **15284, 14172, 14338** and **14339** were submitted by individuals. They were examined chiefly for alcoholic content, but a more complete analysis of **18405** was made as follows:

[1]Jour. Am. Med. Assoc., **70** 6, 407 (1918).

Alcohol by volume	2.87%
Solids	5.92
Ash	0.27
Sugar, as invert	4.01
Acidity, as acetic	0.48
Alkalinity of ash cc. N/10 alkali per 100 gms.	32.1

COCOA.

Four samples have been examined.

Liberty Milk Cocoa, **18408,** labeled pure milk cocoa, submitted by the Dairy and Food Commissioner was analyzed as follows:

Moisture		2.00%
Ash		2.06
Alkalinity of ash, cc. N/10 acid/1 gm.	0.75	
Nitrogen:		
Total	1.60	
From casein	0.42	
Protein:		
Casein		2.68
Other protein		7.38
Fiber		1.48
Nitrogen-free extract:		
Sucrose		65.09
Lactose		4.83
Other N-free extract		4.48
Fat		10.00

The sample appears to be as labeled.

Three samples of unsweetened cocoa submitted by a consumer were of normal composition and quality.

COFFEE, MODIFIED COFFEE, ETC.

Fourteen samples of ground coffee, two of soluble coffee, one of Kaffee Hag and one coffee substitute have been examined.

Two of these were submitted by the Dairy and Food Commissioner. **16393** contained chicory and much starchy matter and was labeled coffee, cereal and chicory. **16721** appeared to be genuine and was passed.

Sample **15158** sent by a purchaser to be tested for adulterants also appeared to be genuine.

Kaffee Hag, **13980,** is coffee from which the caffein has been largely removed. It was found to contain 0.12 per cent. caffein by weight and 0.10 per cent. of caffein calculated from nitrogen in the caffein residue. Previous results[1] were 0.04 and 0.03 per cent. respectively.

Minute Brew, **13981,** a substitute for coffee made from cereal grains contained 11.25 per cent. of protein (N x 6.25), 1.55 per cent. of material insoluble in hot water and was free from caffein.

Partial analyses of eleven samples of ground coffee and two of soluble coffee are given in Table I.

TABLE I. PARTIAL ANALYSES OF COFFEE.

Sta. No.	Brand.	Manufacturer.	Water. %	Ash. %	Fat. %	Caffein, by Wt. %	Caffein, from N. %	Evidence of Chicory, Cereals, etc.
		Soluble Coffee.						
13938	Barrington Hall	Baker Importing Co., New York and Minneapolis.	4.12	15.51	1.32	5.66	5.50	.....
13202	Faust Instant	C. F. Blanke Tea and Coffee, Co., St. Louis.	5.37	14.88	1.11	4.47	4.36	.....
		Ground Coffee.						
13203	Autocrat	Brownell Field Co., Providence, R. I.	5.56	4.05	15.48	.....	.....	none
13183	Benefit	Direct Importing Co., Boston.	7.28	4.03	15.24	.....	.....	none
13966	Boardman's Gold Star	Wm. Boardman Sons Co., Hartford.	6.05	4.23	15.09	.....	.....	none
13940	Boardman's Putnam	Wm. Boardman Sons Co., Hartford.	3.97	4.09	16.21	.....	.....	none
13953	Garden of Allah	Clark & MacKasick Co., Boston.	6.43	4.12	16.40	.....	.....	none
13964	Golden Star	F. C. Bushnell Co., New Haven.	4.57	4.05	14.83	.....	.....	none
13174	Hermitage	Stoddard, Gilbert & Co., Inc., New Haven.	7.09	4.02	15.34	.....	.....	none
13952	Hodbro	Hodes Bros., New Haven.	4.79	4.11	15.44	.....	.....	none
13965	Sunbeam	Austin, Nichols & Co., New York and Chicago.	2.14	4.24	14.63	.....	.....	none
13941	Union Club	Chas. G. Lincoln & Co., Hartford.	4.69	4.08	15.66	.....	.....	none
13939	White House	Dwinell-Wright Co., Boston and Chicago.	4.49	4.16	15.86	.....	.....	none

The soluble coffees are evaporated and pulverized water extracts of coffee. Another preparation of this type, viz., G. Washington Prepared Coffee has been analyzed previously[1] in this laboratory.

DESICCATED FOODS.

A number of evaporated or dried food products made by the Keystone Instant Food Co., Inc., Danbury, Conn., have been analyzed. The products include Clam Broth, **15460;** Vegetable Soup, **15461;** Chicken Gumbo, **15462;** Rice Pudding, **15463;** Roast Beef Hash, **15464,** and Corned Beef Hash, **15465.**

Another product of this type is Cheshire Rabbit, **15184, 15185,** made by Cheshire Kitchens, Inc., 15 Park Row, N. Y. This is an evaporated prepared Welsh rabbit ready to serve after adding milk or water and heating.

Our analyses of these products are as follows:

TABLE II.—ANALYSES OF DESICCATED FOODS.

No.	15460	15461	15462	15463	15464	15465	15184	15185
	%	%	%	%	%	%	%	%
Moisture	8.38	10.58	10.06	6.67	10.81	8.29	9.18	16.88
Ash	34.51	13.67	8.22	3.09	7.15	8.39	7.43	7.88
Protein	36.38	14.06	12.50	12.06	32.25	31.38	30.69*	28.10*
Fiber	.....	3.38	1.26	0.36	0.97	0.80		
Nitrogen-free Extract	19.00	56.56	66.23	77.74	42.31	41.81	13.40	15.74
Fat	1.73	1.75	1.73	0.08	6.51	9.33	39.30	31.40
Salt	29.20	.....	.....	.....	.....	.....	2.84	4.45
Acidity, as lactic acid	.....	.....	.....	.....	.....	.....	1.80	1.87
Color	.....	.....	.....	.....	.....	.....	natural	Orange I

*Nitrogen x 6.38.

DIABETIC FOODS.

A number of diabetic preparations have been examined since our Bulletin 220 on this subject was published. Among them is an interesting product called Cellu Flour.

Cellu Flour, **14555,** is prepared by the Dietetic Cellulose Co., Chicago. It is a carbohydrate substitute made from purified and bleached wood pulp, straw pulp or cotton fiber; it is white, tasteless and non-nutritive, containing no starch, sugar, fat or protein; and is used for filling out reduced diets such as indicated in the Allen Treatment of diabetes. While it furnishes no nourishment it is said to satisfy hunger and reduces the tendency to over-eat. It might be called a psychological food.

The analysis of this flour is as follows:

[1]Conn. Exp. Sta. Report 1916, pp. 186–7.

Moisture	5.52%
Ash	0.30
Protein	none
Fiber	57.25
Nitrogen-free extract:	
Starch	none
Reducing sugars:	
before hydrolysis	none
after hydrolysis	none
Other nitrogen-free extract (modified cellusoses)	36.93
Ether extract	trace

By the conventional method of proximate analysis this material showed 57.25 per cent. of crude fiber and a nitrogen-free extract of 36.93 per cent. It was found, however, that neither the acid nor alkali digestates as obtained in the determination of crude fiber produced copper reducing substances and that therefor presumably, little of the material thus removed is available in digestion but consists rather of soluble cellulose complexes or modifications. This emphasizes the inaccuracy that, in some cases, may attach to the interpretation of nitrogen-free extract as available carbohydrate in calculating calorie yields.

Our attention was called by William G. Beale, of Chicago, and Bar Harbor, Me., to certain bakery products prepared from Cellu flour by the Woman's Baking Co., of Boston. This Company has submitted, at our request, a number of their products which are of particular interest. Samples were also submitted by Mr. Beale.

The products examined are as follows:

Cellu Muffins, **15256;** Bran Muffins, **15257;** Cellu Caraway Cookies, **15258;** Cellu Lemon Cookies, **15259;** Cellu Kisses, **15260;** Cellu Nuts, **15314;** Cocoa Nib Cookies, **15315;** Spice Bran Cookies, **15316;** Cellu Vanilla Cookies, **15317;** Cellu Soup Wafers, **15318;** Cellu Biscuit **15319;** Caraway Bran Cookies, **15320.**

TABLE III.—ANALYSES OF CELLU FLOUR PRODUCTS, ETC.

Sta. No.	Moisture.	Ash.	Nitrogen.	Protein Nx 6.25.	Fiber.	Nitrogen-free Extract.			Fat.	Calories per 100 gms.
						Starch.	Sugar as dextrose.	Other N-free extract.		
	%	%	%	%	%	%	%	%	%	
15256	29.08	5.37	0.59	3.66	18.23	1.61	2.10	27.02	12.93	254
15257	41.51	6.50	1.00	6.26	6.72	1.54	4.83	27.03	5.61	209
15258	14.16	5.48	0.89	5.58	16.53	1.51	2.33	31.95	22.46	368
15259	12.94	5.22	0.69	4.32	17.43	trace	4.62	34.10	21.37	364
15260	17.85	4.09	3.68	23.00	27.12	1.29	1.20	25.22	0.23	205
15314	15.91	5.71	0.86	5.38	16.80	1.07	2.57	23.82	28.74	390
15315	14.87	6.30	1.33	8.33	6.05	6.19	5.05	29.17	24.04	411
15316	16.31	6.43	1.12	6.99	6.90	4.44	7.77	32.48	18.68	375
15317	17.16	5.69	0.71	4.45	16.98	1.58	2.22	32.61	19.31	337
15318	14.22	6.66	0.64	4.01	14.97	1.69	2.43	31.39	24.63	380
15319	32.81	6.33	0.53	3.34	14.26	1.60	1.41	25.65	14.60	259
15320	12.24	6.90	1.30	8.13	2.62	3.15	3.34	38.61	25.01	438

These Cellu products are conspicious for their low nitrogen (except **15260**), low available carbohydrate (starch and soluble reducing sugars), high fiber and high nitrogen-free extract other than starch and sugar. The low or doubtful availability of the last named group should be borne in mind when interpreting the calorie yield which has been calculated in the conventional way including all of the nitrogen-free extract. The bran and part-bran products have distinctly less fiber.

Seven samples of liquors were examined with reference to their fitness for use in a diabetic dietary. Four of the samples were practically free from sugars, one contained a small amount, 3.09 per cent., and two showed larger amounts viz. 14.2 per cent. and 33.52 per cent. The last named amount is too high to be used with safety, and a stimulant with 14 per cent. of sugar should be used with caution.

EGGS AND EGG PRODUCTS.

Twenty-six samples of eggs were examined with reference to the composition of the shells. This work was done in collaboration with Prof. Dunn, of the Storrs Station. The figures given are on the basis of the air-dry shells with the inner membranous lining of the shell removed.

TABLE IV.—ANALYSES OF EGG SHELLS.

Sta. No.	Wt. of shell. grams.	Moisture. %	Lime (CaO). %	Magnesia (MgO). %	Loss on ignition. %
15223	5.7745	0.55	52.20	1.54	45.42
15224	5.7643	0.39	52.24	....	46.07
15225	5.4725	0.29	52.16	2.48	45.78
15226	5.0275	0.35	52.08	1.04	46.25
15227	6.2050	0.29	52.01	1.20	46.15
15228	5.1178	0.40	51.56	1.35	46.39
15229	4.4340	0.29	51.82	....	46.15
15230	5.8283	0.22	51.91	....	45.70
15231	4.8030	0.21	51.99	1.43	45.92
15232	5.0580	0.23	53.28	....	45.54
15233	5.3550	0.34	53.28	....	45.41
15234	5.5155	0.50	51.85	1.61	45.69
15235	5.0840	0.50	52.69	....	45.77
15236	5.4008	0.63	52.18	....	45.67
15237	5.0183	0.64	52.36	....	45.70
15264	4.8412	....	49.40	....	.....
15265	4.8932	....	52.12	....	.....
15266	5.4114	....	51.04	....	.....
15267	5.2107	....	51.16	....	.....
15268	5.5765	....	51.12	....	.....
15269	5.6312	....	49.16	....	.....
15270	5.3247	....	51.56	....	.....
15271	4.9495	....	50.68	....	.....
15272	5.7060	....	50.88	....	.....
15273	4.9926	....	49.52	....	.....
15274	5.4776	....	50.32	....	.....

Egg Powder.

One sample, No. **14680,** was submitted for examination. It was labeled Aigo Baking and Cooking Compound, The Egg-O Co., Baltimore, Md., and stated to consist of sprayed egg yolk, albumen, salt, powdered skimmed milk, starch, gelatin, bicarbonate of soda and to be free from coloring matter.

The presence of egg was indicated by a considerable amount of lecithin phosphoric acid and no artificial color was found.

The anaylsis is as follows:

No.	14680
	%
Moisture	6.83
Ash	9.47
Protein (N x 6.25)	20.48
Starch	26.40
Fat	13.85
Lecithin P_2O_5	0.46
Color	natural.

Egg Noodles.

Eight samples of noodles were examined and the partial analyses are given in the following tabulation.

Table V.—Partial Analyses of Egg Noodles.

Sta. No.	Brand.	Manufacturer or Dealer.	Ash.	Protein.	Lecithin P_2O_5.	Color.
			%	%	%	
13204	Mohican.	Mohican Co., Bridgeport	0.88	16.25	0.044	natural
13205	Mueller's.	C. F. Mueller Co., Jersey City	1.15	13.88	0.037	natural
13208	Warner's.	Warner Macaroni Co., Inc., Syracuse, N. Y.	0.68	14.88	0.028	natural
13209	Freihofer's.	Freihofer Baking Co., Philadelphia, Pa	0.51	12.94	0.034	natural
13935	Climax.	The Pfaffmann Egg Noodle Co., Cleveland, Ohio	1.66	13.44	0.045	natural
13937	Egg Soup Pastels.	Freihofer Baking Co., Philadelphia, Pa	0.78	13.19	0.029	natural
13962	Quaker.	Quaker Oats Co., Chicago	0.75	15.00	0.066	natural
13976	Brown Hen.	American Macaroni Co., Camden, N. J.	1.04	16.56	0.043	natural

The lecithin phosphoric acid content is taken as an index to the amount of egg material present. Accepting Juckenack's standard[1], 0.0225 per cent. of lecithin phosphoric acid may be found in noodles prepared without eggs and this amount is more than doubled by the addition of egg or egg yolk in the proportion of one to a pound of flour. Figures less than 0.035 or 0.040 per cent. do not indicate appreciable amounts of eggs.

[1]Conn. Exp. Sta. Report 1904, p. 138: Leach, Food Inspection and Analysis p. 364.

Dehydrated Eggs.

Two samples of dehydrated fresh eggs were examined. These were Atlas Brand, **13173,** Atlas Specialty Co., New York and Community Brand, **13169,** The Sweet Nut Butter Co., Boston.

Analyses are as follows:

No.	13173	13169
	%	%
Moisture	6.25	6.62
Ash	3.42	3.50
Protein	40.44	43.00
Fat	45.12	42.29
Lecithin P_2O_5	1.37	1.33

These analyses agree with those of similar products previously examined[1] and show the substance of whole egg material.

FATS AND OILS.

Olive Oil.

Five samples of olive oil have been examined and all were passed as genuine. Two of these were sent by the Dairy and Food Commissioner and three were submitted by individuals.

Cooking Fats.

Two samples of Snowdrift Pure Vegetable Shortening **13972** and **18404** and one of Peerless Paste **16158** were examined. Snowdrift is a vegetable product consisting of, or containing cottonseed oil. Peerless Paste contains cottonseed oil but not butter fat although other fat of animal origin may be present. It is interesting to note that this sample responds to tests for carrotin although the material is not sensibly colored.

Butter.

Twenty-three samples of butter have been examined of which twenty-two were submitted by the Dairy and Food Commissioner. Eighteen were passed and five contained excess of water and were deficient in fat. Butter and renovated butter must not contain less than 82.5 per cent. of milk fat and renovated butter must not contain more than 16 per cent. of water.[2] There is no standard for moisture in the definition of butter but obviously it cannot contain much over 16 per cent.

The five samples which did not meet the above requirements are tabulated as follows:

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[1]Conn. Exp. Sta. Bull. 210, p. 212, (1918).
[2]State Regulation 48.

BUTTER BELOW STANDARD.

D.C. No.	Sold for	Dealer (New Haven).	Water.	Curd, Salt, etc.	Fat.	Refraction, 25°C.
			%	%	%	
18105	"Undergrade" butter	J. L. Gold	28.44	1.28	70.28	53.1
16898	Sweet Butter	Morris Gold	22.08	77.92		50.6
18476	Renovated Butter	Morris Gold	29.77	0.93	69.30	52.3
16900	Sweet Butter	Liebmann & Gold	27.03	72.97		51.2
18302	Sweet Butter	Liebmann & Gold	28.71	1.18	70.11	53.0

The adulteration in the above cases consists of excess water and consequent deficiency of milk fat. Sample **18105** was sold for about one half the market price of butter and was marked undergrade so that its substance and quality were not misrepresented. Samples **16898, 18476, 16900** and **18302** were renovated.

OLEOMARGARINE.

Five samples, all submitted by the Dairy and Food Commissioner, were examined for coloring matter, but no evidence of added dyestuffs was obtained. In no case was the product sold for butter.

NUT MARGARINE.

Two new brands of this product have been examined, **13963,** Delicia and **13971,** Palmine, both sold by Van Dyke's Tea Store, New Haven. The analyses of these brands and of eight brands previously reported[1] are given in Table VI.

GELATIN, ETC.

Seven unofficial samples of gelatin were submitted by the Dairy and Food Department for examination. Three of these were distinctly inferior products indicated by bad odor, high fat or high keratin, or both, and in one case by excessive arsenic content.

The data on these products are as follows:

Designation of sample	A 15	A 16	A 21
Total nitrogen	15.69%	15.23%	14.92%
Ash	1.90	2.95	2.84
Fat	0.17	0.30	0.45
Keratin	0.09	0.18	0.11
Arsenic	1:500,000	1:50,000	trace
Copper	none	none	....
Odor	disagreeable	slight	disagreeable
Water solution, cold	cloudy	very cloudy	cloudy
hot	clear	cloudy	....

The ash should not exceed 2 per cent., the fat and keratin should not be much in excess of 0.08 per cent. each, arsenic does not

[1]Conn. Exp. Sta., Bull. 210 p. 203, (1918).

TABLE VI.—ANALYSES OF

Number.	Brand, Manufacturer or Dealer.	Moisture.
		%
8186	A 1. Downey Farrell Co., Chicago	10.84
8169	Cocoanut. Nucoa Butter Co., Soho Park, N. J.	6.53
8170	Providence Churning Co., Providence, R. I.	11.28
9883	Nut-ola. Armour Co.	9.44
9898	Gem. Swift & Co.	12.64
9911	Benefit. Sweet Nut Butter Co., Boston, Mass.	12.35
9937	Kingnut. Kellogg Products, Inc., Buffalo	10.12
9938	Nut Marigold. Marigold Margarine Fact. 5th Dist., N.J.	14.71
13963	Delicia. Van Dyke, New Haven	10.67
13971	Palmine. Van Dyke, New Haven	13.08

ordinarily exceed 1:700,000, a good product should be without odor, and the water solution should be clear.[1]

A product used as a substitute for gelatin in ice cream manufacture was also submitted, No. **16396.** This was found to consist chiefly of starch and Indian gum. Tests for gelatin and tragacanth were negative. The sample contained 2.48 per cent. of ash, 1.60 per cent. of nitrogen and 37.17 per cent. of starch.

ICE CREAM.

Chapter 260 of the Public Acts of 1919 regulates the manufacture and sale of ice cream in this State. It provides that the milk fat content of ice cream (plain) shall be not less than 8 per cent. and that of fruit and nut ice cream not less than 6 per cent. The presence of boric acid, salicylic acid, formaldehyde, saccharin, salts of copper, iron oxide, ochres and injurious colors or flavors in any ice cream is prohibited. Harmless permitted colors and harmless imitation flavors are allowed if their presence is declared. The use of harmless vegetable gums and gelatin is permitted; and ice cream containing less fat than that required by the standards may be manufactured and sold provided the true fat content is made know to the purchaser by suitable signs or labels.

The Dairy and Food Commissioner made a preliminary inspection last year and several hundred samples were taken. These were used as a basis for hearings to advise manufacturers and others

[1]Conn. Exp. Sta. Bull 219 p. 221, (1919).

NUT MARGARINES.

Protein (N x 6.25).	Ash.	Fat.	Free Fatty Acids as Oleic.	Refractometer Reading at 40°C.	Reichert-Meissel No.	Halphen Test.	Nitric Acid Test.
%	%	%	%				
1.25	4.51	83.40	0.45	40.0	7.00	deep pink	brown
0.69	1.58	91.20	0.39	37.2	7.50	yellow	brown
0.75	1.14	86.83	0.47	39.0	6.15	yellow	yellow
2.71	6.06	81.75	0.25	39.0	6.37	yellow	.....
1.36	2.91	83.09	0.95	40.0	6.69	pink	.....
1.29	2.08	84.27	1.11	37.0	6.22	yellow	.....
1.87	3.00	85.01	0.19	38.5	6.50	yellow	.....
1.19	1.51	82.58	1.03	38.0	6.62	yellow	.....
1.66	1.93	85.74	....	35.5	6.40	yellow	yellow
0.83	4.33	81.76	....	36.5	7.90	yellow	yellow

of the provisions of the law. Subsequently 82 official samples were taken of which only three were found to be below standard.

During the past year 47 cities and towns were visited and 400 samples collected. The distribution of the samples and results of analyses are given in the following summary.

Kind of Ice Cream.	No. of Samples collected,	No. of Samples below standard.	Per cent. below standard.
Plain ice cream	331	45	13.6
Fruit ice cream	66	2	3.0
Nut ice cream	3	0	0.0
Total	400	47	11.8

A comparison with the results obtained last year based upon the percentages of milk fat in the sample is as follows:

Range of Fat.	1919 Samples.	1919 Per cent.	1920 Samples.	1920 Per cent.
8 to 8.9	15	18.3	79	19.7
9 to 9.9	10	12.2	55	13.8
10 to 11.9	26	31.7	83	20.8
12 to 13.9	15	18.3	67	16.7
14 to 19.9	13	15.8	56	14.0
20 and above	0	....	2	0.5
Below 8.0	3	3.7	58*	14.5
Total	82	100.0	400	100.0

*Includes 11 fruit creams of legal standard.

The results of the inspection during the past year are given in detail in Table VII. Figures below 8 per cent. in the case of plain ice cream and below 6 per cent. in the case of fruit and nut creams appear in full face type.

TABLE VII.—ANALYSES OF ICE CREAM.

D. C. No.	Dealer.	Manufacturer.	Flavor.	Fat. %
	BRIDGEPORT.			
17346	J. E. Broderick	Stratford Candy Kitchen	Chocolate	12.2
17349	D. J. Broderick	Harris Hart	Chocolate	8.4
17340	Frank Cuneo	Own make	Chocolate	8.0
17345	Eagle Confectionery Co	Own make	Chocolate	9.2
18228	Sigmund Gerstl	Own make	Chocolate	8.0
18446	E. L. Graves	Own make	Chocolate	10.4
17347	Ideal Ice Cream Co	Stratford Ice Cream Co	Chocolate	8.0
17334	Lane Confectionery Co	Own make	Chocolate	13.2
17342	Andrew Musante	Own make	Chocolate	9.6
18440	New England Ice Cream Co	Own make	Chocolate	8.0
18443	George Nicholas	Own make	Chocolate	12.4
17337	Regas & Pappas	Own make	Chocolate	9.2
18225	Royal Candy Kitchen	Own make	Chocolate	11.2
18449	Strand Confectionery Co	Own make	Chocolate	8.4
18223	George Casrientes	Own make	Strawberry	3.6
18226	Crystal Palace Conf. Co	Own make	Strawberry	11.4
18447	E. L. Graves	Own make	Strawberry	10.4
17335	Lane Confectionery Co	Own make	Strawberry	10.8
17343	Andrew Musante	Own make	Strawberry	6.8
18441	New England Ice Cream Co	Own make	Strawberry	9.6
18444	George Nicholas	Own make	Strawberry	12.0
17338	Regas & Pappas	Own make	Strawberry	11.2
18222	Crystal Palace Conf. Co	Own make	Vanilla	10.8
17339	Frank Cuneo	Own make	Vanilla	8.8
17334	Eagle Confectionery Co	Own make	Vanilla	8.0
18227	Sigmund Gerstl	Own make	Vanilla	10.0
18445	E. L. Graves	Own make	Vanilla	11.2
17331	Horsoof Kachbourian	Huber Ice Cream Co	Vanilla	10.4
17333	Lane Confectionery Co	Own make	Vanilla	12.4
17341	Andrew Musante	Own make	Vanilla	8.8
18439	New England Ice Cream Co	Own make	Vanilla	10.0
18442	George Nicholas	Own make	Vanilla	11.6
18229	Frank Ostrofsky	Own make	Vanilla	5.4
17332	The Park Spa	Huber Ice Cream Co	Vanilla	10.4
17336	Regas & Pappas	Own make	Vanilla	10.0
18224	Royal Candy Kitchen	Own make	Vanilla	9.4
17325	Louis Slavin	New England Ice Cream Co	Vanilla	8.8
18448	Strand Confectionery Co	Own make	Vanilla	11.6
	Average			9.7
	BRISTOL.			
17929	Bristol Candy Kitchen	Own make	Chocolate	12.0
17919	J. A. Kennedy	New Haven Dairy	Chocolate	8.0
17925	Palace of Sweets	Own make	Chocolate	15.6
17923	St. Clair Confectionery Co	Own make	Chocolate	14.2
17928	Bristol Candy Kitchen	Own make	Strawberry	11.6
17926	Bristol Candy Kitchen	Own make	Vanilla	12.8

TABLE VII.—ANALYSES OF ICE CREAM.—*Continued.*

D. C. No.	Dealer.	Manufacturer.	Flavor.	Fat. %
	BRISTOL—(*concluded*).			
17920	J. A. Kennedy	New Haven Dairy Co	Vanilla	9.0
17924	Palace of Sweets	Own make	Vanilla	15.0
17922	St. Clair Confectionery Co	Own make	Vanilla	14.4
	Average			12.5
	COS COB.			
18205	M. Taylor	Horton Ice Cream Co	Strawberry	8.0
18204	M. Taylor	Horton Ice Cream Co	Vanilla	8.0
	Average			8.0
	DANBURY.			
17319	Danbury Candy Co	Own make	Chocolate	9.0
18257	H. E. Northrop	Own make	Chocolate	12.4
17320	D. F. Stevens	Own make	Chocolate	**7.0**
18252	Athan & Nicholson	Own make	Strawberry	8.0
18254	Charles Ryder Ice Cream Co	Own make	Strawberry	10.0
18255	Charles Ryder Ice Cream Co	Own make	Strawberry	11.2
17318	Danbury Candy Co	Own make	Vanilla	10.0
18251	Athan & Nicholson	Own make	Vanilla	8.0
18253	Charles Ryder Ice Cream Co	Own make	Vanilla	10.4
17321	D. F. Stevens	Own make	Vanilla	8.0
	Average			9.4
	DANIELSON.			
18084	Mary Salotti	Own make	Chocolate	9.4
17763	Ephrem Auger	J. H. Bouthillier	Coffee	**6.4**
16848	Cola Bros	Own make	Coffee	8.4
17762	Ephrem Auger	J. H. Bouthillier	Strawberry	6.8
18083	Mary Salotti	Own make	Strawberry	8.4
17761	Ephrem Auger	J. H. Bouthillier	Vanilla	11.4
18206	George Berris	New Haven Dairy	Vanilla	9.6
16847	Cola Bros	Own make	Vanilla	8.0
18100	Mary Salotti	Own make	Vanilla	9.0
17764	A. P. Woodward	Own make	Vanilla	**7.4**
	Average			8.5
	EAST PORT CHESTER			
18273	J. Tuchim	Neilsons	Chocolate	8.0
18274	J. Tuchim	Neilsons	Strawberry	8.0
18300	J. Tuchim	Neilsons	Vanilla	9.0
	Average			8.3
	FAIRFIELD.			
18260	Henderson Bros	Huber Ice Cream Co	Chocolate	9.4
17350	Henderson Bros	Huber Ice Cream Co	Vanilla	10.8
	Average			10.1

TABLE VII.—ANALYSES OF ICE CREAM.—*Continued.*

D. C. No.	Dealer.	Manufacturer.	Flavor.	Fat. %
	FARMINGTON.			
17501	Frederick Swanston	Hackney	Chocolate	8.4
17502	Frederick Swanston	Hackney	Vanilla	**6.3**
	Average			7.3
	FORESTVILLE.			
17917	Purity Ice Cream Co	Own make	Chocolate	**6.1**
17913	White Rock Ice Cream Co	Own make	Chocolate	9.8
17915	White Rock Ice Cream Co	Own make	Maple	9.2
17918	Purity Ice Cream Co	Own make	Strawberry	8.0
17914	White Rock Ice Cream Co	Own make	Strawberry	9.4
17911	James Holden	White Rock Ice Cream Co	Vanilla	10.0
17916	Purity Ice Cream Co	Own make	Vanilla	9.6
17912	White Rock Ice Cream Co	Own make	Vanilla	10.5
	Average			9.1
	GREENWICH.			
18291	Greenwich Drug Store	Horton Ice Cream Co	Chocolate	**6.6**
18289	Finch's Pharmacy	Horton Ice Cream Co	Chocolate	8.3
18282	J. H. Hall	Own make	Chocolate	8.8
18280	Kataris & Joseph	Own make	Chocolate	8.2
18287	A. B. Libano	Own make	Chocolate	8.2
18202	Pickwick Shop	Own make	Chocolate	15.0
18203	Pickwick Shop	Own make	Coffee	13.2
18283	J. H. Hall	Own make	Strawberry	8.0
18278	L. Kataris	Own make	Strawberry	8.4
18286	W. B. Libano	Own make	Strawberry	8.0
18276	Frank Zamfino	Own make	Strawberry	7.2
16168	Boswell Drug Co	Horton Ice Cream Co	Vanilla	8.6
18292	Boswell Drug Co	Horton Ice Cream Co	Vanilla	**5.8**
18288	W. E. Fitch's Pharmacy	Horton Ice Cream Co	Vanilla	8.0
18290	Greenwich Drug Store	Horton Ice Cream Co	Vanilla	8.0
18281	J. H. Hall	Own make	Vanilla	10.0
18277	L. Kataris	Own make	Vanilla	10.8
18279	Kataris & Joseph	Own make	Vanilla	8.0
18289	A. B. Libano	Own make	Vanilla	13.2
18201	Pickwick Shop	Own make	Vanilla	14.4
18275	Frank Zamfino	Own make	Vanilla	**7.9**
	Average			9.7
	GROTON.			
18689	Scuris Bros	Own make	Chocolate	**7.2**
18688	Scuris Bros	Own make	Vanilla	8.4
	Average			7.8

TABLE VII.—ANALYSES OF ICE CREAM.—*Continued.*

D. C. No.	Dealer.	Manufacturer.	Flavor.	Fat. %
	HARTFORD.			
18092	Thomas Appell	Own make	Chocolate	9.0
17904	Atlas Confectionery Co	Own make	Chocolate	8.8
17852	Besse	Own make	Chocolate	10.4
18096	Crown Confectionery Co	Own make	Chocolate	11.6
17902	Eagle Confectionery Co	Own make	Chocolate	14.4
17854	Goodwin Drug Co	Own make	Chocolate	11.2
17905	Goodwin Drug Co	Own make	Chocolate	9.2
17909	A. P. Leonard	Own make	Chocolate	14.0
18097	Liberty Confectionery Co	Own make	Chocolate	10.8
17859	Palace of Sweets	Own make	Chocolate	14.4
18089	Royal Candy Kitchen	Own make	Chocolate	9.6
17908	J. P. Treautafelacos	Own make	Chocolate	13.0
18093	Thomas Appell	Own make	Strawberry	9.0
18098	Crown Confectionery Co	Own make	Strawberry	12.8
17855	Goodwin Drug Co	Own make	Strawbe ry	11.2
18099	Liberty Confectionery Co	Own make	Strawberry	11.4
18090	Royal Candy Co	Own make	Strawberry	11.2
18091	Thomas Appell	Own make	Vanilla	11.2
17903	Atlas Confectionery Co	Own make	Vanilla	12.6
17851	Besse	Own make	Vanilla	12.0
18094	Crown Confectionery Co	Own make	Vanilla	13.2
17901	Eagle Confectionery Co	Own make	Vanilla	16.0
17853	Goodwin Drug Co	Own make	Vanilla	11.6
17906	Goodwin Drug Co	Own make	Vanilla	11.2
17910	A. P. Leonard	Own make	Vanilla	15.4
18095	Liberty Confectionery Co	Own make	Vanilla	8.4
17857	Newton Robinson & Co	Own make	Vanilla	8.2
17858	Palace of Sweets	Own make	Vanilla	15.2
18088	Royal Candy Co	Own make	Vanilla	10.0
17907	J. P. Treautafelacos	Own make	Vanilla	11.2
17856	Wise, Smith & Co	Hartford Ice Cream Co	French Vanilla	12.4
	Average			11.6
	JEWETT CITY.			
17773	Fred Maynard	Own make	Chocolate	**7.6**
18284	Alleandro Pieraccini	Own make	Chocolate	**5.6**
17775	Dennis J. Sullivan	Own make	Chocolate	9.0
17774	Dennis J. Sullivan	Own make	Lemon	8.8
18230	Alleandro Pieraccini	Own make	Vanilla	**6.7**
17772	Fred Maynard	Own make	Vanilla	11.8
	Average			8.3
	KILLINGLY.			
17899	Fred Espinosa	Own make	Coffee	**4.8**
17900	Fred Espinosa	Own make	Vanilla	**6.0**
	Average			5.4
	MANCHESTER.			
17843	Manchester Dairy Ice Cream Co.	Own make	Chocolate	9.4
17845	Manchester Dairy Ice Cream Co.	Own make	Coffee	11.6
17844	Manchester Dairy Ice Cream Co.	Own make	Strawberry	12.0
17842	Manchester Dairy Ice Cream Co.	Own make	Vanilla	12.0
	Average			11.2

TABLE VII.—ANALYSES OF ICE CREAM.—*Continued.*

D. C. No.	Dealer.	Manufacturer.	Flavor.	Fat. %
	MERIDEN.			
17279	Allis Bros	Own make	Caramel	14.6
17281	Albert Eichorn	Own make	Cherry Bisque.	9.6
17278	Allis Bros	Own make	Chocolate	13.6
17284	Clarence Katt	Own make	Chocolate	11.8
17288	New Haven Dairy Plant	Own make	Chocolate	10.6
17282	Albert Eichorn	Own make	Maple Nut	13.6
17286	J. F. Furman	Own make	Strawberry	7.2
17285	Clarence Katt	Own make	Strawberry	10.8
17289	New Haven Dairy Plant	Own make	Strawberry	9.2
17290	New Haven Dairy Plant	Own make	Tutti Fruitti	9.0
17277	Allis Bros	Own make	Vanilla	15.4
17280	Albert Eichorn	Own make	Vanilla	14.8
17292	Mrs. Sarah Furman	J. F. Furman	Vanilla	**6.0**
17283	Clarence Katt	Own make	Vanilla	11.0
17287	New Haven Dairy Plant	Own make	Vanilla	9.6
	Average			11.1
	MILFORD.			
17348	Ideal Ice Cream Co	Stratford Ice Cream Co	Vanilla	11.6
	MOOSUP.			
17768	Habbib Abbood	Own make	Chocolate	**1.2**
17771	F. W. Daggett	Own make	Coffee	15.6
17767	Habbib Abbodd	Own make	Vanilla	**5.4**
17769	Devisso & Co	Connie McGaughery	Vanilla	8.2
	Average			7.6
	MYSTIC.			
18691	Peter Hammecher	Own make	Chocolate	12.0
18695	E. W. Haskell	Own make	Coffee	12.4
18693	John Wheeler	Own make	Coffee	18.0
18694	E. W. Haskell	Own make	Vanilla	13.6
18690	Peter Hammecher	Own make	Vanilla	15.2
18692	John Wheeler	Own make	Vanilla	20.0
	Average			15.2
	NEW BRITAIN.			
17880	Louis Gourson	Hartford Ice Cream Co	Chocolate	8.8
17308	C. E. McEnroe	Own make	Chocolate	13.6
17883	John Contaris	Own make	Chocolate	11.6
17305	St. Clair Confectionery Co	Own make	Chocolate	11.6
17302	Star Confectionery Co	Own make	Chocolate	12.8
17306	St. Clair Confectionery Co	Own make	Strawberry	12.0
17303	Star Confectionery Co	Own make	Vanilla	17.0
17882	John Contaris	Own make	Vanilla	12.4
17881	Edith Kopel	New Haven Dairy	Vanilla	9.2
17307	C. E. McEnroe	Own make	Vanilla	13.6
17304	St. Clair Confectionery Co	Own make	Vanilla	11.6
17301	Star Confectionery Co	Own make	Vanilla	13.6
	Average			12.3

TABLE VII.—ANALYSES OF ICE CREAM.—*Continued.*

D. C. No.	Dealer.	Manufacturer.	Flavor.	Fat. %
	NEW HAVEN.			
17315	John Basel	Own make	Chocolate	**7.4**
17255	Davis Drug Co	New Haven Dairy	Chocolate	9.2
17258	Huylers	Own make	Chocolate	14.4
17257	Liggett Drug Co	Semon Ice Cream Co	Chocolate	8.4
18460	New Haven Dairy Co	Own make	Chocolate	**7.6**
17262	Petersons	New Haven Dairy	Chocolate	10.2
17310	Theodore Tramis	Own make	Chocolate	8.4
17310	Peter Vallani	Own make	Chocolate	8.5
17311	Peter Vallani	Own make	Peach	6.4
17316	John Basel	Own make	Strawberry	7.0
17261	Huylers	Own make	Strawberry	12.0
18461	New Haven Dairy	Own make	Strawberry	8.0
17314	John Basel	Own make	Vanilla	**7.3**
17354	Davis Drug Co	New Haven Dairy	Vanilla	9.9
17259	Huylers	Own make	Vanilla	11.8
17256	Liggett Drug Co	Semon Ice Cream Co	Vanilla	9.4
18462	New Haven Dairy	Own make	Vanilla	8.4
17260	Petersons	New Haven Dairy	Vanilla	11.0
17296	Theodore Tramis	Own make	Vanilla	8.0
17309	Peter Vallani	Own make	Vanilla	9.6
	Average			9.1
	NEW LONDON.			
18687	Dimon Ballassi	Own make	Chocolate	16.4
18671	Conti Bros	Own make	Chocolate	8.4
18665	George Kozinos	Own make	Chocolate	13.6
18673	Johns & Manabas	Own make	Chocolate	14.0
18669	Peter Lalaty	Own make	Chocolate	11.8
18685	Basil D. Nichols	Own make	Chocolate	12.8
18623	Emanual Nichols	Own make	Chocolate	15.2
18675	S. F. Peterson	Own make	Chocolate	15.2
18677	Socrates Peterson	Own make	Chocolate	12.8
18675	E. E. Stratas	Own make	Chocolate	13.0
18681	Mohican Hotel	Own make	Coffee	13.2
18667	Abraham J. Maloof	Own make	Lemon	11.2
18686	Dimon Ballassi	Own make	Vanilla	17.0
18670	Conti Bros	Own make	Vanilla	11.2
18664	George Kozinos	Own make	Vanilla	15.6
18672	Johns & Manabas	Own make	Vanilla	14.0
18668	Peter Lalaty	Own make	Vanilla	13.6
18666	Abraham J. Maloof	Own make	Vanilla	11.2
18680	Mohican Hotel	Own make	Vanilla	22.0
18684	Basil D. Nichols	Own make	Vanilla	14.0
18682	Emanual Nichols	Own make	Vanilla	15.6
18676	Socrates Peterson	Own make	Vanilla	13.6
18674	S. F. Peterson	Own make	Vanilla	17.2
18678	E. E. Stratas	Own make	Vanilla	13.8
	Average			14.4

TABLE VII.—ANALYSES OF ICE CREAM.—*Continued.*

D. C. No.	Dealer.	Manufacturer.	Flavor.	Fat. %
	NORWALK.			
18298	Combis Candy Kitchen	DeKlym	Chocolate	8.0
18265	M. Cowas	Own make	Chocolate	8.0
18271	Cochinos & Notis	Own make	Chocolate	13.2
16170	Solomon Hatten	Horton Ice Cream Co.	Chocolate	8.4
18293	C. DeKlym	Own make	Chocolate	8.0
18268	Zapperson & Pappas	Own make	Chocolate	12.4
18272	Cochinos & Notis	Own make	Coffee	13.2
18299	Combis Candy Kitchen	Own make	Strawberry	8.0
18266	M. Cowas	Own make	Strawberry	8.0
16171	Solomon Hatten	Horton Ice Cream Co.	Strawberry	7.9
18296	C. DeKlym	Own make	Strawberry	7.2
18269	Zapperson & Pappas	Own make	Strawberry	9.6
18270	Cochinos & Notis	Own make	Vanilla	13.2
18297	Combis Candy Kitchen	DeKlym	Vanilla	8.4
18264	M. Cowas	Own make	Vanilla	9.2
18395	C. DeKlym	Own make	Vanilla	8.0
18267	Zapperson & Pappas	Own make	Vanilla	11.6
	Average			9.5
	NORWICH.			
18245	Tilly D. Becker	Own make	Chocolate	12.4
17792	Christ. Bell	Own make	Chocolate	17.0
17787	John A. Johnson	Own make	Chocolate	**7.6**
17790	Lagos Bros	Own make	Chocolate	8.2
17794	Stavros Peterson	Own make	Chocolate	13.0
17783	Peter Sellis	Own make	Chocolate	**6.4**
17785	Crystal Confectionery Co.	Own make	Coffee	9.0
18244	Tilly D. Becker	Own make	Strawberry	16.8
17798	George Conlopoulus	Own make	Strawberry	9.6
17781	Peter Constandi	Own make	Strawberry	10.2
17796	James Ganosel	Own make	Strawberry	15.4
17791	Christ. Bell	Own make	Vanilla	18.0
17784	Crystal Confectionery Co.	Own make	Vanilla	8.8
17780	Peter Constandi	Own make	Vanilla	8.2
17797	George Conlopoulus	Own make	Vanilla	9.0
17795	James Ganosel	Own make	Vanilla	15.4
17786	John Johnson	Own make	Vanilla	8.6
17789	Lagos Bros	Own make	Vanilla	12.8
17788	Prekaris Bros	Own make	Vanilla	**5.7**
17793	Stravros Peterson	Own make	Vanilla	16.0
17782	Peter Sellis	Own make	Vanilla	9.8
	Average			11.3
	NORTH GROSVENORDALE.			
17751	W. B. Chandler	Nectar Products Co.	Chocolate	12.4
16850	Theophelus Donville	Own make	Strawberry	8.8
17752	W. B. Chandler	Nectar Products Co.	Vanilla	9.2
16849	Theophelus Donville	Own make	Vanilla	8.4
	Average			9.7

TABLE VII.—ANALYSES OF ICE CREAM.—*Continued.*

D. C. No.	Dealer.	Manufacturer.	Flavor.	Fat. %
	PAWCATUCK.			
18242	John D. Traggis	Own make	Chocolate	12.8
18243	John Traggis	Own make	Coffee	15.2
18241	Charles Vardilos	Own make	Coffee	15.6
18240	Charles Vardilos	Own make	Vanilla	15.2
	Average			14.7
	PUTNAM.			
17756	Strombelis Bros	Progress Mfg Co	Chocolate	9.0
17760	J. E. Talbot	Own make	Chocolate	**5.0**
17758	Ernest Whittemore	Smith Bros	Chocolate	10.8
17754	James Ryan	Anderson & Patterson	Strawberry	10.4
17753	James Ryan	Anderson & Patterson	Vanilla	12.8
17755	Strombelis Bros	Progress Mfg. Co	Vanilla	9.6
17749	J. E. Talbot	Own make	Vanilla	**5.3**
17757	Ernest Whittemore	Smith Bros	Vanilla	11.8
	Average			9.3
	ROCKVILLE.			
18002	John E. Gawtrey	Own make	Chocolate	**4.7**
17847	Palace of Sweets	Own make	Chocolate	13.8
17850	Mary Cuneo	Tait Bros	Coffee	9.2
18004	John Gawtrey	Own make	Coffee	**4.2**
18005	Mary Cuneo	Tait Bros	Pineapple	8.4
18748	Palace of Sweets	Own make	Strawberry	14.8
18003	John E. Gawtrey	Own make	Strawberry	**2.8**
17849	Mary Cuneo	Tait Bros	Vanilla	11.2
17846	Palace of Sweets	Own make	Vanilla	14.4
18001	John Gawtrey	Own make	Vanilla	**3.9**
	Average			8.7
	SOMERS.			
18007	Grace Holmes	Own make	Strawberry	10.0
18006	Grace Holmes	Own make	Vanilla	13.2
	Average			11.6
	SOMERSVILLE.			
18009	Homer Ice Cream Co	Own make	Chocolate	10.4
18008	Homer Ice Cream Co	Own make	Vanilla	13.2
	Average			11.8
	SOUTH MANCHESTER.			
17839	Mamacos & Ambulos	Own make	Chocolate	13.6
17841	Mamacos & Ambulos	Own make	Coffee	14.0
17840	Mamacos & Ambulos	Own make	Strawberry	13.6
17838	Mamacos & Ambulos	Own make	Vanilla	14.8
		Average		14.0
	SOUTH NORWALK.			
18428	New England Candy Co	Own make	Chocolate	12.0
18426	Charles Thomas	Own make	Chocolate	12.0

TABLE VII.—ANALYSES OF ICE CREAM.—*Continued.*

D. C. No.	Dealer.	Manufacturer.	Flavor.	Fat. %
	SOUTH NORWALK—(*concluded*).			
18431	Henry Wilkins	Own make	Chocolate	1.2
18434	Henry Wilkins	Own make	Chocolate	4.5
18427	Charles Thomas	Own make	Peach	10.0
18429	Plainsted Drug Store	DeKlym	Vanilla	10.0
18425	Charles Thomas	Own make	Vanilla	11.0
18430	Henry Wilkins	Own make	Vanilla	3.6
18432	Henry Wilkins	Own make	Vanilla	3.4
18433	Henry Wilkins	Own make	Vanilla	2.5
	Average			7.0
	SOUTHPORT.			
18262	M. R. Perry	Semon Ice Cream Co	Chocolate	10.0
18261	M. R. Perry	Semon Ice Cream Co	Vanilla	10.4
18263	M. Switzer	Horton Ice Cream Co	Vanilla	8.6
	Average			9.7
	STAMFORD.			
18213	G K. Lawrence	Own make	Chocolate	11.0
16169	Xanthos Candy Co	Own make	Chocolate	13.2
18209	United Candy Co	Own make	Chocolate	8.6
18215	Eagle Candy Co	Own make	Chocolate	14.0
18217	Mazza & Co	Own make	Chocolate	4.9
18219	Olympia Confect. Co	Own make	Strawberry	11.2
18211	Xanthos Candy Co	Own make	Strawberry	12.4
18214	Eagle Candy Co	Own make	Vanilla	15.2
18216	Mazza & Co	Own make	Vanilla	5.2
18212	G. K. Lawrence	Own make	Vanilla	14.0
18221	G. K. Lawrence	Own make	Vanilla	13.4
18220	G. Scannalle	Own make	Vanilla	6.2
18207	Paul Sabini	Star Confectionery Co	Vanilla	8.0
18218	Olympia Confect. Co	Own make	Vanilla	11.2
18208	United Candy Co	Own make	Vanilla	9.2
18210	Xanthos Candy Co	Own make	Vanilla	12.8
	Average			10.6
	STONINGTON.			
18698	Victor Danesi	Maine Creamery Co	Chocolate	7.8
18239	Francis D. Burtch	Own make	Chocolate	15.6
18699	Victor Danesi	Maine Creamery Co	Coffee	8.4
18697	Paul Schepis	Dolby Ice Cream Co	Coffee	11.0
18238	Francis Burtch	Own make	Vanilla	13.6
18696	Paul Schepis	Dolby Ice Cream Co	Vanilla	10.2
	Average			11.1

TABLE VII.—ANALYSES OF ICE CREAM.—*Continued.*

D. C. No.	Dealer.	Manufacturer.	Flavor.	Fat. %
	STRATFORD.			
17327	Stratford Candy Kitchen	Own make	Chocolate	8.8
17328	Stratford Candy Kitchen	Own make	Strawberry	11.6
17326	Stratford Candy Kitchen	Own make	Vanilla	12.8
	Average			11.1
	SUFFIELD.			
17867	George Martinez	New Haven Dairy	Chocolate	8.4
17870	F. H. Reid	Own make	Chocolate	8.0
17869	F. H. Reid	Own make	Strawberry	6.4
17866	George Martinez	New Haven Dairy	Vanilla	9.6
17868	F. H. Reid	Own make	Vanilla	10.8
17871	Peter Janik	Tait Bros	Vanilla	10.0
	Average			8.9
	THOMPSONVILLE.			
18010	Harry Zirolli	Tait Bros	Chocolate	9.2
18013	Rice Bros	Own make	Chocolate	12.4
18014	Rice Bros	Own make	Strawberry	10.0
18011	Harry Zirolli	Tait Bros	Strawberry	9.2
18015	F. Athen & J. Devine	New Haven Dairy	Vanilla	8.6
18016	M. J. Dineen	Own make	Vanilla	15.2
18012	Rice Bros	Own make	Vanilla	13.2
	Average			11.1
	TORRINGTON.			
16645	Torrington Creamery	Own make		9.2
16646	Torrington Creamery	Own make		9.0
	Average			9.1
	UNCASVILLE.			
17799	Pappas Bros	Own make	Vanilla	8.8
	UNIONVILLE.			
17504	Hackney Ice Cream Co	Own make	Chocolate	7.1
17865	Hackney Ice Cream Co	Own make	Chocolate	8.0
17861	Heiman Ice Cream Co	Own make	Chocolate	9.0
17863	Heiman Ice Cream Co	Own make	Maple Nut	9.6
17505	Hackney Ice Cream Co	Own make	Strawberry	6.8
17862	Heiman Ice Cream Co	Own make	Strawberry	11.2
17864	Heiman Ice Cream Co	Own make	Vanilla	10.6
17503	Hackney Ice Cream Co	Own make	Vanilla	9.6
17860	Heiman Ice Cream Co	Own make	Vanilla	10.6
	Average			9.2
	WALLINGFORD.			
17294	Ally & David	Own make	Chocolate	11.2
17295	Ally & David	Own make	Strawberry	11.8
17293	Ally & David	Own make	Vanilla	13.2
	Average			12.1

TABLE VII.—ANALYSES OF ICE CREAM.—*Concluded.*

D. C. No.	Dealer.	Manufacturer.	Flavor.	Fat. %
	WAUREGAN.			
18658	John Albro	Own make	Chocolate	**6.8**
17765	Harmidos Wilmot	Own make	Coffee	**6.4**
18657	John Albro	Own make	Vanilla	8.0
17766	Harmidos Wilmot	Own make	Vanilla	**7.2**
	Average			7.1
	WEST HAVEN.			
17929	J. D. Illions	Semon Ice Cream Co	Chocolate	8.6
17931	Fred LeVere	Harris Hart Ice Co	Chocolate	8.4
17934	Nicholas Parela	Semon Ice Cream Co	Chocolate	9.2
17933	Harry Pite	New Haven Dairy Co	Chocolate	9.6
17932	Fred LeVere	Harris Hart Ice Cream Co	Strawberry	9.2
17930	Fred LeVere	Harris Hart Ice Cream Co	Vanilla	9.6
	Average			9.1
	WESTPORT.			
18294	J. J. O'Connor	DeKlym	Chocolate	8.4
	WILLIAMANTIC.			
16839	Hallock & Holbrook	Own make	Chocolate	16.0
16846	Patrick McDermott	Horton Ice Cream Co	Chocolate	**5.0**
16845	Peter Yanclas	Own make	Chocolate	13.4
16840	Hallock & Holbrook	Own make	Coffee	16.4
16806	William Morris	Own make	Coffee	15.2
16841	Styles Sisters	Own make	Peach	11.6
16837	William Morris	Own make	Strawberry	15.6
16838	Hallock & Holbrook	Own make	Vanilla	16.0
16835	William Morris	Own make	Vanilla	15.6
16842	Styles Sisters	Own make	Vanilla	15.8
16844	Peter Yanclas	Own make	Vanilla	14.4
	Average			14.1
	WINDSOR LOCKS.			
17877	Charles Colli	Homer Ice Cream Co	Chocolate	12.4
17872	Louis Molinari	Peter Fossa	Chocolate	8.8
17875	Vito Colapietro	Own make	Chocolate	**7.5**
17876	Vito Colapietro	Own make	Maple Nut	6.8
17874	Vito Colapietro	Own make	Vanilla	8.8
17879	Vito Colapietro	Own make	Vanilla	**3.2**
17873	Louis Molinari	Peter Fossa	Vanilla	9.6
17878	Charles Colli	Homer Ice Cream Co	Vanilla	13.2
	Average			8.8
	Average of State			10.1

The averages given for each city or town do not of course adequately represent the true conditions in the several localities. Data as to the gross sales of the various grades is necessary to show the true average quality available. For the same reason the average for the total number of samples does not properly represent the average market condition in the State; and the double standard further complicates the calculation. The larger manufacturers have naturally standardized their products at a figure close to the legal standard and their combined output constitutes the greater part of the gross supply. Of the smaller producers many, no doubt, are unwittingly furnishing rich cream through lack of careful factory control while others may be intentionally supplying an extra quality product to a limited or special class of trade. At any rate the figures show many samples testing well in excess of 8 per cent. and the average of all samples collected is 10.1 per cent.

Forty-seven samples, or 11.8 per cent. of the total number were below standard.

Of 4 samples submitted by individuals 1 was below standard.

MILK AND MILK PRODUCTS.

Market Milk.

Ten hundred and fifty-four samples of market milk have been examined for the Dairy and Food Commissioner, classified as follows:

Not found adulterated	752	71.4%
Adulterated by dilution with water	58	5.5
Adulterated by skimming	18	1.8
Adulterated by reason of being:		
below standard in solids and solids-not-fat	100	9.4
below standard in solids and fat	19	1.8
below standard in solids, fat and solids-not-fat	107	10.1
Total	1054	100.0

The number of samples found diluted with water is conspicuously less than in preceding years. Our data with respect to the quality of milk by official inspection summarized for the periods 1913 to 1917 inclusive and 1918 to 1920 inclusive are as follows:

	Period 1913-1917.		Period 1918-1920.	
Not found adulterated	815	43.0%	2246	60.9%
Adulterated by dilution with water	276	14.5	367	9.9
Adulterated by skimming	37	1.9	131	3.6
Otherwise adulterated or below standard	770	40.6	946	25.6
Total	1,898	100.0	3,690	100.0

This summarizes the history of the inspection of market milk for the past eight years and indicates a substantial improvement in the quality of this important product. This summary does not adequately represent the general quality of the milk in the State for the reason that, as we have stated previously, official samples, in perhaps the majority of cases, are taken upon suspicion of inferiority or adulteration and in response to complaints of local milk inspectors, health officers or dairy technicians. It is reasonable to presume therefor, that the average quality of milk sold in the State as a whole is better than the above figures indicate.

Samples found adulterated during the past year, other than those below standard are given in Table VIII.

Milk Submitted by Individuals.

One hundred and two samples of milk were examined for consumers, producers and others of which seventy-five were passed and twenty-seven were adulterated or below standard. None of these require particular comment.

Cream.

Two samples were submitted by the Dairy and Food Commissioner and four by individuals.

Tester's License.

Four samples of cream and two samples of milk have been examined to check candidates for certificates as provided in Sec. 2, Chapter 221, Public Acts of 1917.

Imitation Milk, etc.

13975. *Super-Cream.* Walter Jahn's "Super-Cream" made by the Rico Milk Products Co., East Troy, Wisconsin. Stated to contain at least 24 per cent. butter fat, and 31 per cent. total solids. Price 27 cents per can containing 7.5 ozs.

Analysis showed the following composition:

	As Sold.	Diluted with 5 parts water (calc.).
Solids	31.56%	5.26%
Ash	0.67	0.11
Protein	3.06	0.51
Sugar	3.83	0.64
Fat	24.00	4.00
Net weight	7.5 ozs.	....

The composition as stated on the label is substantiated by the analysis. However, the statement, which appears on the label, that "Super-Cream can be used wherever a rich milk is desired by the addition of five parts of water" is misleading. Such dilution would yield a product which approaches rich milk only as regards

TABLE VIII.—ADULTERATED MILK.

No.	Dealer.	Solids.	Fat.
	Containing Added Water		
	ANDOVER.		
17455	Frank Swartz	9.93	3.4
	BRANFORD.		
16338	E. W. Caldwell	10.19	3.2
16345	E. M. Yale	10.35	3.4
16346	E. M. Yale	10.59	3.2
16347	E. M. Yale	10.83	3.4
	BRISTOL.		
14989	A. H. LaLane	11.27	3.4
	DURHAM.		
16306	David Bros.	10.54	3.1
16307	David Bros.	10.66	3.2
16308	David Bros.	11.52	3.8
16309	David Bros.	10.77	3.2
16310	David Bros.	9.77	3.2
	ELMWOOD.		
17999	Elmwood Catholic Ch.	9.55	3.0
	MILFORD.		
18504	Cecil Clark	10.12	3.1
18505	Cecil Clark	9.86	2.8
18507	Antonio Negosmeki	10.68	3.4
	NEWINGTON.		
18472	Wm. Bishop	10.52	3.4
18473	Wm. Bishop	11.06	3.6
18474	Wm. Bishop	10.68	3.3
	NEWTOWN.		
16320	Frank Valalik	10.71	3.2
16321	Frank Valalik	10.44	3.2
16322	Frank Valalik	9.87	2.6
	NORWICH.		
18783	Herbert Gardner	6.97	2.5
18784	Herbert Gardner	11.90	4.4
16786	John McLean	9.35	3.0
	ORANGE.		
16348	Benj. Hempstead	9.20	3.4
16126	M. DeCaprio	10.61	3.2
16342	Modestino DeCaprio	10.59	3.2
	SOUTHBURY.		
15344	H. M. Cassidy	10.18	2.8
16118	Thos. Lovedale	11.27	3.6
	Containing Added Water.—continued.		
	SOUTHINGTON.		
18479	Mrs. Neils Johnson	10.17	3.6
	SOUTH NORWALK.		
18526	Fred Frillow	10.49	3.2
	TORRINGTON.		
15629	Fred Lehman	11.64	4.0
16617	F. B. Woodward	11.57	3.7
16618	F. B. Woodward	10.98	3.4
16612	Chas. Zangg	11.64	3.8
	TRUMBULL.		
16333	Andrew Persztai	9.63	2.9
	WALLINGFORD.		
17638	Wilbur C. Fenn	10.53	3.2
17355	W. J. Self	9.61	3.2
17356	W. J. Self	9.47	3.0
17357	W. J. Self	10.30	3.6
17358	W. J. Self	10.07	3.6
17359	W. J. Self	10.47	3.6
	WATERBURY.		
17380	D. M. Rogers	10.83	3.3
	WATERTOWN.		
17484	John Popow	7.63	2.5
17485	John Popow	8.60	3.1
17486	John Popow	8.34	2.8
17487	John Popow	8.86	3.0
	WEST HARTFORD.		
18450	W. F. Brewer	9.81	2.4
15540	Ralph Gerth	11.15	3.5
18452	A. M. Morrell	6.93	1.4
	WESTPORT.		
14986	Leonard Gault	10.19	3.2
16397	Leonard Gault	9.34	3.2
16398	Lenoard Gault	10.07	3.2
16399	Leonard Gault	8.54	2.6
16400	Leonard Gault	9.95	3.0
	WILLIMANTIC.		
18981	John W. Gilman	10.33	3.3
18978	L. P. Oehrig	9.61	2.7
18979	L. P. Oehrig	9.61	2.9

TABLE VIII.—ADULTERATED MILK.—*Concluded.*

No.	Dealer.	Solids.	Fat.	No.	Dealer.	Solids.	Fat.
	Skimmed Milk				*Skimmed Milk—Concluded.*		
	ANSONIA.				NORWICH.		
16468	Presto Lunch	11.25	2.3	18761	Boston Cafe	11.07	1.8
	EAST CANAAN.			18763	Wauregan Hotel	11.96	3.1
16545	S. Serlin	10.71	2.2		PLANTSVILLE.		
	DANIELSON.			16244	Stanley Tycz	9.96	1.8
18965	W. S. Brown	10.22	1.7		PUTNAM.		
	MOOSUP.			18968	H. Callas & G. Anas	11.72	2.9
18961	Joseph Cournoier	11.02	2.5	18966	Delvina Thereault	9.75	1.1
	NAUGATUCK.				TORRINGTON.		
15692	J. Daily	10.79	2.3	15220	F. J. Barton	12.81	3.3
	NEW LONDON.				WILLIMANTIC.		
18708	Far East Lunch	9.47	1.1	18984	H. Israel & Son	11.28	2.5
18709	New China Co.	9.82	1.5	18982	J. T. Nichols	11.17	2.7
18704	N. Y., N. H. & H. R.R. Co.'s Restaurant	9.62	1.2	18980	T. F. Shea	10.66	1.7
18718	Sea Food Lunch	8.90	0.9				

fat content as shown by the calculated analysis. The diluted product would be watered cream, not rich milk.

13175. *En-Zo.* "Imitation Milk. A compound of evaporated skimmed milk and refined cocoanut fat". Stated to contain 6.1 per cent. vegetable fat and 24 per cent. total solids. Made by the Enzo Company, Denmark, Wisconsin.

13970. *Carolene.* "A compound of refined nut oils and evaporated skimmed milk." The label also states that the product is composed of "fresh cow's milk, butter fat removed and highly refined cocoanut oil substituted", and that it contains 24 per cent. solids and 6 per cent. refined nut oils. Made by The Carolene Co., Inc., 130 No. Wells St., Chicago.

These products are of the same type as Hebe, a sample of which has already been examined in this laboratory.[1]

The composition of these products is shown by the following analyses:

[1]Conn. Exp. Sta., Bulletin 210, p. 224 (1918).

	13175	13970
Number		
Solids	23.19%	24.86%
Ash	1.50	1.59
Protein	6.76	6.89
Sugar	8.79	10.48
Fat	6.14	5.90
Constants of fat:		
Butyro-refractometer at 40°C.	36.8	36.00
Reichert-Meissel No.	9.2	.....

MILK POWDER.

Four samples of milk powders have been examined.

Klim brand, Powdered Whole Milk, **14412**; Klim brand, Powdered Skimmed Milk, **14413**; and Powdered Modified Milk, **15037**, for infant feeding, all made by the Merrell-Soule Co., Syracuse, N. Y.

Powdered Skimmed Milk, **14809**, made by the National Dry Milk Co., Dacoming, Wisconsin.

Products of this class examined by us in previous years have been summarized in an earlier Bulletin[1] from this laboratory.

Analyses of the products examined this year are as follows:

TABLE IX.—ANALYSES OF MILK POWDERS.

	14412 %	14413 %	15037 %	14809 %
Moisture	3.23	4.00	2.76	5.03
Ash	5.98	8.23	7.15	7.88
Protein (N x 6.38)	24.88	33.55	17.23	33.36
Lactose (by difference)	37.75	53.08	53.52	53.03
Fat	23.16	1.14	19.34	0.70
Acidity (as lactic acid)	....	....	0.85	1.72

In case of the whole milk powder it is directed to take eight special measures to one quart of water to make one quart of whole milk. Provided the powder is so measured as to obtain four and one-half ounces a milk of good quality will be secured. To do this however, the special measure which accompanies the package must be rather closely packed.

The analysis of the modified milk powder is substantially as stated on the label of this product.

MALTED MILK, ETC.

Six samples of products of this class have been examined. The brands include Borden's **13967**; Horlick's **13969**; and two products made by Thompson's Malted Food Co., Waukesha, Wisconsin, viz., Thompson's Malted Milk, **13579, 13968** and Thompson's Hemo, **13580, 14260.** Hemo is stated to consist of the combined extractives of barley and selected wheat, pastuerized milk, beef peptones and hemoglobin.

Analyses of these products are as follows:

[1]Conn. Exp. Sta., Bulletin 213, p. 406 (1919).

TABLE X.—ANALYSES OF MALTED MILK, ETC.

Number	13967	13969	13968	13579	13580	14260
Moisture	2.55%	3.05%	4.04%	3.72%	2.74%	...
Ash	2.93	3.80	3.80	4.32	4.65	...
Protein	14.38	15.06	10.00	12.75	13.50	...
Fiber	0.45	0.40	0.26	0.12	0.09	...
Nitrogen-free extract	70.71	69.59	74.69	73.59	73.62	...
Fat	8.98	8.10	7.12	5.50	5.40	...
Starch	none	none	none	trace	none	...
Iron (Fe.)	0.0013	0.0020	0.0002	....	0.0013	0.0050

Hemo contained 1.86 per cent. of water-soluble nitrogen distributed as follows: coaguable 0.87, precipitable by tannin-salt 0.83, residual 0.16. Malted milk, **13968**, contained 1.47 per cent. of water-soluble nitrogen distributed as follows: coaguable 0.83, precipitable by tannin-salt 0.49, residual 0.14. In the case of Hemo about 45 per cent. of the water-soluble nitrogen was precipitated by tannin-salt while in malted milk about 33 per cent. was precipitated by the same reagent indicating a larger proportion of nitrogenous substances of the peptone group in Hemo. It is understood, however, that tannin-salt is not a specific reagent for peptones, but precipitates other intermediate digestion products of protein such as proteoses, polypeptides, etc. The comparative figures given above are interesting, but the data is insufficient as a basis for any general conclusion.

Hemoglobin is the coloring matter of blood-corpuscles and is conspicuous for its iron content. The comparative figures for iron in the analyses given above show in one sample of Hemo no more iron than was found in Borden's malted milk; the second sample, **14260**, shows substantially more. Again the figures are suggestive rather than conclusive on account of limited data. According to analyses available in the literature the iron content of milk itself shows wide variations due in part no doubt to analytical differences.

The method we have employed for the determination of iron is as follows:[1]

Standard solution: Dissolve 0.7 gram of crystallized ferrous ammonium sulphate in 50 cc. of distilled water, acidify with 20 cc. of dilute sulphuric acid, heat slightly, add N/10 potassium permanganate until a faint pink color is obtained and dilute to a volume of 1000 cc. One cc. of this solution is equivalent to 0.0001 gm. of Fe. Prepare a series of standards using 1, 2, 3, etc., cc. of this solution to which is added 5 cc. of a solution of potassium thiocyanate (1:50) and dilute to a volume of 50 cc.

Determination: Burn 10 grams of sample in a platinum dish avoiding excessive heat. Add 5 cc. of conc. hydrochloric acid to dissolve the ash, transfer to a 100 cc. flask, add sufficient N/10 potassium permanganate to produce a faint pink color and dilute to volume. Filter if necessary. Take an aliquot of 40 cc. (= 4 gms. original material) add 5 cc. of potassium thiocyanate and dilute to 50 cc. Mix and compare with standards.

[1]Standard Methods of Water Analysis. Am. Public Health Asssoc., 1917, p. 44.

Human Milk.

Fourteen samples of breast milk have been examined chiefly at the request of physicians and of the Visiting Nurse Association of New Haven. The value of these analyses is entirely dependent upon whether or not the samples are representative. All of the milk available at the time of feeding should be drawn and thoroughly mixed before sampling. The variations in composition between so-called 'foremilk', 'middlemilk', and 'strippings' from cows is well known. Söldner[1] has shown what these variations may be in the case of milk drawn from the human milk gland. In the following tabulation, Table XI, the first, second and third portions correspond to the fractions just indicated.

Table XI.—Composition of Different Portions of Human Milk.

Sample.	Portion.	Weight of portion gms.	Solids. %	Protein (Nx6.38). %	Fat. %	Sugar. %	Ash. %
17	1st	33.1	8.82	1.15	1.71	5.50	0.46
	2nd	33.3	9.75	0.96	2.77	5.70	0.32
	3rd	57.3	10.72	0.83	4.54	5.07	0.28
67	1st	48.3	9.87	0.89	1.94	6.82	0.22
	2nd	30.3	14.11	0.89	3.07	9.92	0.23
	3rd	40.1	11.74	1.08	4.58	5.87	0.21
93	1st	39.6	8.44	1.08	1.23	5.97	0.16
	2nd	37.9	9.66	0.89	2.50	6.03	0.24
	3rd	41.9	12.17	0.89	4.61	6.43	0.24
118	1st	30.0	9.02	1.08	2.54	5.17	0.23
	2nd	22.5	10.42	1.02	3.98	5.17	0.25
	3rd	31.8	13.70	1.08	7.20	5.17	0.25

It is at once evident from these figures that the variations are chiefly due to fluctuations in fat content; and that no adequate idea of the substance and quality of the milk supply can be obtained unless the entire secretion of the gland is drawn and mixed before sampling. Thus the fat content of the entire yield in case of sample 17 is 3.22 per cent.

Analyses of the samples submitted during the past year are given in Table XII.

Table XII.—Analyses of Human Milk.

Station No.	Solids %	Protein (N x 6.38). %	Fat. %	Sugar. %	Ash. %
13634	14.10	1.37	5.8	6.73	0.20
14295	10.39	1.24	1.6	7.32	0.23
14296	...	2.23	2.64	....	....
14353	...	...	2.50	....	0.31
14398	12.95	1.72	4.0	7.00	0.23
14632	10.80	1.28	2.0	7.29	0.23
14942	15.59	...	6.9	..	0.19

[1]Lane-Claypon, Milk and Its Hygienic Relations, p. 23.

TABLE XII.—ANALYSIS OF HUMAN MILK—*Continued.*

Station No.	Solids	Protein (N x 6.38).	Fat.	Sugar.	Ash.
	%	%	%	%	%
14969	13.14	1.28	4.5	7.11	0.25
15105	14.77	1.50	5.3	7.75	0.22
15016	13.34	1.46	3.7	7.94	0.24
15172	...	...	4.0	...	...
15180	...	1.21	6.8	...	...
15221	12.17	1.02	3.8	7.17	0.18
15295	12.20	1.08	3.6	7.31	0.21

SYRUPS.

Two samples of bakers' syrups were examined.

14202. *Syromal.* It was found to contain 50 per cent. of cane sugar and 16.6 per cent. of invert sugar as determined by copper reduction methods. Polarizations at 20°C. were direct +36.3°, invert—10.4°.

14203. *Syrup,* claimed to be made of cane syrup, honey and acetic acid. It contained 42.8 per cent. of cane sugar and 30.2 per cent. of invert sugar. Polarizations at 20°C. were direct ±0°, invert —20.0°.

TEA.

No samples of tea were examined during the past year for inspection purposes, but methods for the determination of caffein were further studied and the results included in the report of the writer as Referee on tea to the Association of Official Agricultural Chemists at their annual meeting in November 1920.

The Power and Chestnut method[1] was studied and recommended to the Association as an official method. The Stahlschmidt method[2] which is now tentative, was further modified[3] so that caffein residues of a high degree of purity can be obtained. A new proceedure was also evolved[4], based upon the two methods just mentioned and the Deker[5] method, which has thus far been found to give satisfactory results and which is rapid and simple to manipulate. The two last named methods are being submitted for collaborative study with a view to the adoption of one or the other as an optional official method.

The proposed new method is as follows:

Preparation of sample: Grind the tea to pass a 1/25 inch sieve.

Assay: To 5 grams of material in a 500 cc graduated flask add 10 grams of heavy magnesium oxide and 200 cc. of distilled water. Boil gently over a low flame for two hours using a small bore glass tube 30 inches long as a condenser. Cool, dilute to volume and filter through a dry paper. Take an aliquot of 300 cc., equivalent to 3 grams of original material in

[1]Jour. Am. Chem. Soc., **41,** 1300.
[2]Jour. A. O. A. C. **2,** 3, 332.
[3]By C E. Shepard and the writer.
[4]By R. E. Andrew and the writer.
[5]Chem Zentr **1,** 1, 62, 1903.

an erlenmeyer flask of 1,000 cc. capacity, add 10 cc. of a 10 per cent. solution of sulphuric acid and evaporate by gentle boiling until the volume is reduced to about 100 cc. Filter into a separatory funnel washing the flask with small portions of 1 per cent. sulphuric acid, and shake out six times with chloroform using 25, 20, 15, 10, 10, 10 cc. portions. Treat the combined extracts with 5cc. of a 1 per cent. solution of potassium hydroxide. When the liquids have completely separated draw off the chloroform layer into a suitable flask or beaker. Wash the alkaline solution in the separatory with two portions of chloroform of 10 cc. each and unite the washings with the main bulk of extract. Evaporate or distill off the chloroform to small bulk, transfer to a tared flask, evaporate to dryness, and further dry in a water oven at 100°C. to constant weight.

If desired, transfer the residue thus obtained to a digestion flask with successive small portions of sulphuric acid and determine nitrogen by the Kjeldahl method, calculating caffein from nitrogen by the factor 3.464.

The results obtained by the several methods are given in Table XIII.

TABLE XIII.—CAFFEIN IN TEA.

	Stahlschmidt Method.		Power and Chestnut Method.		Proposed Method.	
	By weight.	From N.	By weight.	From N.	By weight.	From N.
	%	%	%	%	%	%
Black tea, 4...	2.83	2.81	3.06	2.99	2.98	2.86
	2.89	2.87	3.05	3.03	2.94	2.87
	2.86	2.84	3.05	2.95	2.92	2.82
	....	....	....	....	2.80[1]	2.80[1]
	....	....	....	....	2.84[1]	2.80[1]
Green tea, 5...	1.64	1.63	1.61	1.55	1.70	1.61
	1.65	1.59	1.69	1.60	1.66	1.58
	....	....	....	....	1.77	1.66
	....	....	....	....	1.57[1]	1.52[1]
	....	....	....	....	1.62[1]	1.57[1]
Green tea, 9...	2.09[2]	1.94	2.12	2.01	2.14	2.08
Black tea, 10..	2.71[2]	2.63	2.69	2.67	2.62	2.62
Black tea, 12..	3.10[2]	2.96	3.20	3.12	3.00	2.93
	....	....	....	....	3.15	3.03
	....	....	....	....	3.12	2.99

Satisfactory methods[3] have been worked out for caffein in coffee but we have been interested to try the proposed method on that substance. In two samples tried we have obtained the following results:

Sample No.	Power and Chestnut Method.		Proposed Method.	
	By weight.	From N.	By weight.	From N.
	%	%	%	%
15409.....	1.51	1.47	....	....
	1.49	1.45	1.61	1.49
15410.....	0.21	0.17	....	....
	0.21	0.18	0.28	0.24

[1]Results by H. A. Lepper.
[2]Not purified by treatment with potassium hydroxide.
[3]H. A. Lepper, A. O. A. C. Referee on Coffee, Report of 1920.

Sample **15410** was a decaffeinated product. The results suggest that the method is probably applicable also to coffee.

VINEGAR.

One sample of vinegar submitted by the Dairy and Food Commissioner and nine by individuals have been examined for total solids and acidity. Three were found deficient in one or both particulars and seven were passed. The alcohol content of one of the samples was asked for. No alcohol was found as, of course, should be the case in the well made product.

MISCELLANEOUS MATERIALS.

Foods, Etc.

Five samples of miscellaneous food products collected by the Station agent and 8 submitted by individuals have been examined.

13954. *Ice cream cones*, made by the Repeater Cone Co., Cheshire, Conn., were found to be free from saccharin and preservatives. They contained: moisture 8.14 per cent., ash 1.05 per cent., protein 7.00 per cent., fat 1.02 per cent., nitrogen-free extract and fiber 82.79 per cent.

13977. *Orangeade Paste*, prepared by Emma Curtis, Melrose, Mass., The preparation is stated to contain fruit flavor and artificial color. It was found to contain 79.43 per cent. of solids, 68.70 per cent. of sugar (expressed as invert sugar), natural fruit flavor and a permitted color, Orange I. No preservative was found. This product has been examined once before[1] in this laboratory with substantially the same results.

13942. *Vanilla Paste*, made by Gra-Rock Products Co., Canton, Conn. Contents of one tube stated to be equivalent to 1 pint of liquid extract. No weight was given but the contents (squeezed out) weighed 36.7 grams. When mixed with a pint (473cc.) of water the solution or emulsion contained 0.01 gram of vanillin per 100 cc. equivalent to 0.13 per cent. in the original paste. The paste consists essentially of gum, glycerine and sugar with a small amount of vanillin. Vanilla extract of standard quality contains in 100 cc. the soluble matter from not less than 10 grams of vanilla bean[2]. The amount of vanillin obtained from 10 grams of vanilla bean will depend upon the quality of the bean and may vary from 0.07 to 0.24 gram[3]. However, this paste contained 0.047 gram of vanillin while the least amount that a pint of vanilla extract may be expected to contain is about 0.33 gram. We are advised that the manufacture of this product has been discontinued.

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[1]Conn. Exp Sta. Bull. 219, p. 240 (1919).
[2]Standards of Purity for Food Products, U. S. D. A. Cir. 136, (1919).
[3]Conn. Exp. Sta. Report, 1901, p. 150.

13979. *Cherry Fam-ly-ade,* and **13978,** *Raspberry Fam-ly-ade,* made by the Fruit Valley Corporation, Rochester, N. Y. Each of these preparations was contained in a two-compartment glass vial; one solution consisted of, or contained, the color and sugar and the other (smaller) contained the flavor. The flavoring solution of **13979** contained 1.67 grams of benzaldehyde per 100 cc. while the flavor of **13978** appeared to be citric acid with some natural raspberry.

14391. *Baking Powder,* was found to be of standard quality as regards available carbondioxide, of which it contained 12.89 per cent.

15072 and **15165.** *Cheese,* two samples, contained 36.35 per cent. and 32.38 per cent. of moisture respectively.

15385 and **16168.** *Honey.* The samples were suspected of containing added glucose but no evidence of adulteration was found.

14170. *Orange Marmalade,* was suspected of containing artificial sweetener. No saccharin or glucose was found.

14402. *Pepper* (white), thought to contain a large amount of foreign material, conformed to the standards for white pepper. The sample contained moisture 9.03 per cent., ash 1.24 per cent., nitrogen 2.15 per cent., crude fiber 4.23 per cent., ether extract 7. 75 per cent. and ash insoluble in acid 0.10 per cent.

15170. *Surface Water,* was submitted for examination for an explanation of a scum thought to be oil. Examination showed, in parts per million, solids 320, loss on ignition (organic) 143, and mineral matter 177. Qualitative tests for iron were strong and there was no indication of oil. The fluorescent scum was due probably to organic iron compounds.

WINES, LIQUORS, ETC.

Ninety-one samples of alcoholic beverages have been examined for alcoholic content, or the presence of methyl (wood) alcohol, or both. The samples have been submitted chiefly by physicians, health and police officials and Prohibition Enforcement agents; and a considerable number of them have been examined by the writer as State Chemist.

Among these samples were eight taken from stock seized by Police and Detectives of Hartford in connection with the sale and consumption of "poison whiskey" which resulted in numerous deaths in that city and neighboring cities during the Christmas Holidays of 1919. On the day of the seizures samples were turned over to this laboratory where the nature of the deadly mixture was discovered and reported to the prosecutor. Of the eight samples six contained from 31.7 to 47.7 per cent. of pure methyl (wood) alcohol, one was fusel oil, used to imitate the whiskey flavor and one was genuine whiskey. Prosecutions which resulted developed the following history: A consignment of 1,000 gallons of

methyl alcohol shipped from a distillery in Michigan to a firm in London, England to be used for technical purposes and plainly marked, was stolen in Brooklyn, N. Y., while in transit, and distributed by a gang of bootleggers for beverages purposes. Three barrels found their way into this State with the results already stated, and had it not been for the prompt action of the Hartford authorities much greater disaster would have resulted.

This unfortunate affair naturally threw suspicion for a time upon all alcoholic liquors which accounts in part for the unusual number of samples submitted.

Other Materials Examined for Poisons, Etc.

Fourty-five samples of miscellaneous materials have been submitted by individuals or public officials to be examined for poisons or suspicious substances. In nine of these, examinations revealed or suggested the probable cause of the symptons or results noted.

14503. *Cake* with cocoanut frosting. The cake was suspicious because the cocoanut turned intensely pink after 24 hours. The pink color was extracted from the cocoanut and shown to be a dye, but not identified. A similar color was extracted from the cake itself. The reaction of the cocoanut on the bottom layer which was overlaid with the alkaline cake did not turn pink. It appeared that the cocoanut absorbed from the cake a color which developed a pink shade in presence of an acid.

14851. *Cider Vinegar.* This was reported to have made several persons ill. A large or considerable amount of arsenic was found.

14292. *Viscera of two geese and a duck.* The birds had died suddenly. Qualitative tests indicated considerable amounts of yellow phosphorus.

14394. *Milk and cereal* mixture prepared for feeding an infant. The sample submitted weighed 180 grams and contained 36 grains of carbolic acid. This amount would no doubt have proved fatal if it had been fed. It is recorded that 22 grains proved fatal to an adult.

14900. *Intestinal contents of a pig.* Large quantities of antimony were found.

15241. *Crystalline substance* found in bottle of milk. It proved to be potassium alum.

14452. *Old Fashioned Brown Sugar.* Complaint was made that an insoluble substance formed when milk was used with it in making candy. It was found that the sugar had an acidity requiring 14 cc. of N/10 alkali to neutralize it. When milk containing this sugar was boiled a coagulum formed. Milk containing the neutralized sugar formed no coagulum on heating. Directions were given for neutralizing the sugar with sodium bicarbonate to obviate the difficulty.

D. C. No. **18409.** *Domino Old Fashioned Brown Sugar.* Complaint was made similar to that in case of **14452.** A sample of the "insoluble substance" was submitted which was found to contain a considerable amount (2 per cent.) of nitrogen. Acidity was not determined but the explanation is doubtless the same as that already stated for the previous sample.

14201. D. C. Nos. **16501** and **18402.** *Rainbow Sugars.* The colors found were amaranth, indigo, carmine and tartrazine, all permitted colors.

15020. *Well Water.* A sediment in the water was shown to be iron rust or scale.

The remainder of the samples require no comment.

II. DRUGS, ETC.

PROPRIETARY REMEDIES.

Five preparations of this class have been examined.

13167. *Bliss Native Herbs*[1]. The Alonzo O. Bliss Medical Company, Washington, D. C. The remedy is stated to be free from opiates, narcotic drugs and mineral poisons. Forty-five cents was paid for a box of 67 tablets.

Examination and analysis show the following composition:

Average weight of tablets 0.34 gram; reaction faintly aicd; taste bitter. Analysis, parts per hundred: moisture 4.16 ash 6.43 (sulphates, trace, calcium, magnesium and phosphates, considerable); nitrogen 1.00; aloes and licorice present; ginger and cassia indicated; capsicum?; alkaloids none.

13171. *Kalpho,* prepared by the Parker Biochemic Company, New York. Nature's nerve tonic for the treatment of nervousness, sleeplessness, brain fag, etc.; a natural nerve food; contains no harmful nor habit-forming drug. Such are statements taken from the advertising literature.

Examination and analysis show the following composition:

Average weight of tablets 0.074 gram. Analysis parts per 100: moisture 0.08; ash 0.05 (calcium, sulphates and phosphates none or trace); iodides and bromides none; lactose, hydrated 97.7; extractives with ether from acid and from alkaline solutions, 0.12 and 0.03 respectively; extractives with chloroform from acid and from alkaline solutions 0.10 and 0.05 respectively; tests for alkaloids negative.

The tablets consist of milk sugar probably treated with some medicament in homeopathic dilution. We find no harmful drugs, or anything else of apparent potency.

13168. *Caldwell's Syrup Pepsin and Herb Laxative Compound.* The Pepsin Syrup Co., Monticello, Ill. Five fluid ounces cost 55 cents.

[1]See also Street, Patent and Proprietary Medicines, p. 36.

Examination and analysis show the following composition:

Specific gravity at 15.6 °C. 1.200; alcohol by volume 5.30 per cent. The following constituents are in grams per 100 cc. Solids 52.81; ash 0.46 (calcium and magnesium present, phosphates and sulphates trace); invert sugar 1.54; sucrose 50.03; emodin-like substances present, senna indicated; salicylic acid (or salicylates) present; ether extractives from acid solution 0.216; chloroform extractives from alkaline solution, 0.026. Cloves and cinnamon flavor.

13172. *Cinot*, made by the Cinot Syndicate, Chicago, and extensively advertised as the Wonder Medicine of the Age. $1.20 was paid for a bottle of 8 fluid ounces.

Examination and analysis show the following composition:

Specific gravity at 15.6°C. 1.0553; alcohol by volume 0.20 per cent. Other constituents are in grams per 100 cc. Solids 13.79; ash 1.22 (phosphoric acid 0.04, sulphur trioxide, 0.10 calcium oxide 0.21, magnesium oxide 0.07); invert sugar 3.29; sucrose 4.22; vegetable material other than sugar 5.06; ether extractives from acid solution 0.67; emodin-like substances present, rhubarb indicated; salicylic acid (or salicylates) present; chloroform extractives from alkaline solution 0.024; alkaloids trace? not indentified.

The preparation is an aqueous solution containing about 14 per cent. of solids one-half of which is sugar and the remainder mineral and vegetable matter consisting of, or containing cathartic drugs including rhubarb. Aside from any efficacy the salicylate may have as a rheumatism remedy it also serves the more useful purpose (to the manufacturers) of preserving the liquid in the enforced absence of an appreciable amount of alcohol.

Possibly the secret of the wonderful remedial effects which are said to follow the use of this medicine is to be found in the literature contained in the package where we read in the directions "Drink plenty of water."

13170. *Allenrhu.* Made by the Alle-Rhume Remedy Co., Rochester, N. Y. Indicated for all conditions of rheumatism, etc. Price $1.50 for 16 fluid ounces.

Examination and analysis show the following composition:

Specific gravity at 15.6°C. 1.0848; alcohol none; the following constituents are in grams per 100 cc.: solids 13.93; ash 6.64 (phosphoric acid 1.72, sulphur trioxide 1.84, calcium and magnesium present); ether extractives from acid solution 0.82 (salicylic acid 0.76); chloroform extractives from alkaline solution 0.01; alkaloids trace?; invert sugar 1.90 sucrose 1.00; organic material (non-sugars) 4.39; emodin-like substances none.

The preparation is an aqueous solution of mineral salts, salicylic acid (or salicylates) with sugar and other organic material. The usual laxative vegetable drugs are not indicated.

SOAP.

Fats and oils are essentially combinations of fatty acids and glycerol. When treated with caustic alkali they undergo a definite chemical process (saponification) whereby the acidic portion of the fat or oil combines with alkali, glycerol is liberated and a soap is formed. In broad terms any metallic salt of a fatty acid is a soap; thus lead, zinc, calcium or magnesium soaps are made and have special uses. But the soaps of household use are the alkali-metallic (sodium or potassium) salts of fatty acids, and it is to this class that the term soap is generally restricted.

Taking as an example a common fat, 890 parts of stearin treated with 120 parts of caustic soda yield 918 parts of sodium soap and 92 parts of glycerol. Incidentally this shows an important reason for the war time economy in the use of fats since about one-tenth of the weight thereof is glycerol which is an essential in the manufacture of munitions.

The art of soap making is of ancient origin, but its chemistry is comparatively modern. Pliny describes a product made from goat's tallow and wood ash lye, and the treatment of fats in this manner is not entirely forgotten in the present day.

Both the character of the fat or oil used and the kind of alkali employed will determine the nature and quality of the resulting soap. The solid vegetable or animal fats, or fatty acids therefrom, with sodium produce hard soaps, while fish and vegetable oils with potassium yield soaps of softer variety. But with the same oil or fat the soap formed by the use of sodium is harder than that formed when potassium is the saponifying agent.

The soaps of sodium and potassium are soluble in water, in which particular they differ from the soaps of other metals and to which they owe their practical importance. The soaps of calcium and magnesium are insoluble and advantage is taken of this fact to distinguish hard waters. If a soluble soap becomes insoluble in water from a particular source it indicates the presence of lime or magnesia to which the hardness of water is due.

So-called marine or salt water soaps are sodium soaps of palm nut or cocoanut oils. They are not rendered insoluble by dilute brine solutions and hence a lather can be produced with them in sea water.

The most important property of soap is its detergent or cleansing action to explain which several theories, none entirely conclusive, are offered. Considerable emphasis has been given to the action of free alkali resulting from hydrolysis of the soap in solution. Mechanical affect has been advanced as an explanation based on the readiness with which soap removes mineral oils from metal surfaces. Since mineral oils do not saponify the chemical factor is eliminated in this instance. Probably the complete explanation includes also a consideration of the Brownian movement or pedisis of the lather, the formation of adsorption

compounds and the peculiar properties of colloidal solutions, of which soap in a water "solvent" represents a type.

Judgment of the quality of soap depends upon the purpose for which it is intended. Free alkali should be absent in toilet soap but it is permissible, and in limited amount, advantageous in soaps for scouring and manufacturing purposes. As a rule the less extraneous matter a soap contains the better its quality but there are exceptions such, for example, as the addition of starch to soap for use on woolen or silk fabrics. Insoluble earthy matters, unless for abrasive purposes, are regarded as adulterants; but alkali carbonates, silicates and borates are permissible on account of their detergent properties.

The detailed analysis of soap presents numerous difficulties, some of which are pointed out by Low[1] in a discussion of proposed standard methods of soap analysis. The complex nature of even the common types of laundry soap makes it impossible to show their exact chemical composition by the ordinary uniform methods of systematic analysis. We have attempted, however, to gain a general idea of the substance and quality of the soaps examined by determining the more conspicuous constituent groups by methods generally employed. The samples herein reported have been examined in two different years and the methods used in case of the older samples differ in some respects from those used in later examinations. The methods used in 1919 were based upon those outlined in Allen[2], Sadtler[3], Lewkowitsch[4] and the Bureau of Standards[5]. More recent tentative standard methods[6] have been followed in part in case of samples examined in 1920.

Methods of Analysis.

Preparation of sample: Reduce one transverse half of the solid cake to thin shavings or, if possible, run the entire cake through a food chopper, mix well and place in a tightly stoppered container.

Water (and volatile): Dissolve 2 grams of the sample in the smallest possible amount of hot 95 per cent. alcohol. Completely absorb the alcoholic solution of soap with recently ignited asbestos contained in a flat bottom dish, the dish and asbestos being first accurately tared, evaporate on a steam bath and finally dry to constant weight at 100°C.

It was found that practically constant weights were obtained after 5 hours drying except in case of soaps containing large or considerable amounts of glycerin. Since many soaps contain appreciable quantities of glycerin and soaps generally, particularly laundry soaps, contain it to some extent, a method of drying in a vacuum over sulphuric acid at room temperature was tried. This alternate proceedure is as follows:

[1]Jour. Ind. Eng. Chem, **11**, 12, 1169. (1919).
[2]Commercial Organic Analysis, 4th Ed., **2**, 422 et seq.
[3]Industrial Organic Chemistry, p. 85.
[4]Chem. Technol. and Analysis of Oils, Fats and Waxes.
[5]U. S. Dept. Commerce, Bureau of Standards, Circ. 62.
[6]Jour. Ind. Eng. Chem. **11**, 8, 785.

Weigh 2 grams of the sample into a shallow dish, provided with a tight fitting cover to prevent absorption of moisture while weighing the dried sample, place in a desiccator over sulphuric acid, exhaust, and allow to stand for 24-hour periods agitating the surface of the acid occasionally by gentle shaking.

The weight was found to be constant at 96 hours and a shorter period was generally sufficient. Comparative losses by these two methods of drying are given in the following tabulation.

Sample No.	Loss on Drying. Water oven at 100°C. %	In vacuum at room temp. %	Remarks.
13182	4.63	4.63	.....
13185	9.92	8.23	Glycerin claimed.
13186	5.02	4.76	.....
13187	10.16	7.37	Glycerin claimed.
13188	4.55	4.25	.....
13189	13.31	8.29	Glycerin claimed.
13190	5.11	3.87	Glycerin?.
13191	11.21	6.70	Glycerin claimed.

The results by the two methods are seen to agree reasonably well unless glycerin is present. Sample **13190** may have contained this constituent. Neither method represents the true water content of the soaps as considerable volatile matter other than water is lost at the higher temperature while water itself in combinations with certain alkali salts (carbonates and silicates) probably remains in either case.

Unsaponified and unsaponifiable matter: Transfer the dry residue, obtained in the determination of water, to an extraction tube and extract with petroleum ether for sixteen hours in a continuous extraction apparatus. Evaporate the solvent and dry the residue at 100°C. This will give *free fatty acids*, if present, *neutral fat*, and *unsaponifiable matter*. Deduct from this figure the per cent. of free fatty acids as determined subsequently by titration.

Free alkali and free acid: Dissolve 2 grams of the sample in hot neutral 95 per cent. alcohol, filter through a Gooch crucible, wash with the solvent and add a few drops of phenolphthalein to the filtrate. If the reaction is alkaline titrate with N/10 acid and express the result as per cent. of sodium hydroxide. If the reaction is acid titrate with N/10 alkali and express as per cent. of oleic acid (1 cc. of N/10 alkali is equivalent to 0.0282 gram oleic acid).

Alkalinity due to corbonates, silicates and borates: Exhaust the residue in the crucible (obtained in the previous determination of free alkali or free acid), by repeated additions of boiling water, transfer to a 100 cc. volumetric flask, cool and make up to volume. Titrate an aliquot with N/10 acid, using methyl orange as an indicator. The result is the alkalinity due to carbonates, silicates, etc., and is expressed in terms of per cent. of sodium oxide, Na_2O.

Material insoluble in alcohol and in water: Wash the residue still remaining in the crucible (from the previous determination), with a little alcohol and ether, dry at 100°C. and weigh.

Fatty (and resin) anhydrides: In our first analyses Method A was used. Since then Method B has been published[1] and this proceedure was followed in case of samples examined in 1920.

(A) Dissolve 2 grams of sample in 50 cc. of hot water in an Erlenmeyer flask, add 20 cc. of N/2 sulphuric acid and heat on the steam bath until the fatty acids form a clear layer on the surface of the solution. Bring the fatty acids up into the neck of the flask with hot water, and allow to cool. Loosen the hardened fatty acids and, without removing them, filter off the acid solution, saving the same for subsequent titration to determine total alkali. Add 50 cc. of hot water to the fatty acids in the flask and heat again until they form a clear layer, finally bring them into the neck of the flask and allow to harden. Mechanically remove the plug of hardened fatty acids to a small tared beaker. Pass the aqueous solution through the same filter previously employed and combine the filtrate with the previous one saved for the determination of total alkali. To the main portion of fatty acids in the tared beaker add any particles which have accumulated on the filter. If any traces adhere to the sides of the original flask, rinse out the dry flask with small portions of petroleum ether and add the washings to the tared beaker. Evaporate off the solvent, dry at 100°C and weigh. Deduct from this weight the total petroleum ether extract (which included free fatty acids, unsaponified fat, and unsaponifiable matter), and obtain the weight of fatty and resin acids combined as soap. The factor 0.97 has been used to convert figures for fatty and resin acids to their anhydrides although for certain oils this may be inaccurate.

Note. In some cases the fatty acids are liquid or semi-liquid at room temperature. In such instances weigh out 2 grams of dry beeswax and add it to the soap solution. The separated fatty acids will become incorporated with the wax and form a cake. Correct the final weight for the weight of the wax added.

(B). Dissolve 5 grams of soap in 100 cc. of water in a weighed 400 cc. Erlenmeyer flask. When completely dissolved add dilute sulphuric acid in slight excess, place a funnel in the neck of the flask and heat on a steam bath at a temperature not above 80°C until the fatty acids form a clear oily layer. Cool and transfer both fatty acids and acid water to a separatory funnel washing out adhering fat from the flask with petroleum ether (B. P. not over 65°C) using about 50 cc. of solvent. Shake out the fatty acids, avoiding too vigorous agitation, and allow the liquids to separate. Draw off the acid solution. Wash the petroleum ether layer in the separatory with three 25 cc. portions of water adding the washings to the acid solution first separated. Extract the acid solution with petroleum ether in 50, 25, and 25 cc. portions, unite the three extracts and wash with water as in case of the original petroleum ether solution. Filter the original petroleum ether solution and the petroleum ether extracts of the acid washings, both of which are now free from water-soluble impurities, through a paper wet with petroleum ether into a tared flask of suitable capacity provided with a stirring rod. Wash the filter free from fatty acids. Add 100 cc. of freshly boiled neutral 95 per cent. alcohol to the filtrate and titrate with N/10 sodium hydroxide to neutrality using phenolphthalein as an indicator. Calculate Na_2O as soap after deducting for free fatty acids in the original soap. Evaporate the neutral petroleum ether-alcohol solution to dryness breaking up any lumps of soap that may form by means of the stirring rod provided for the purpose. Dry to constant weight at a temperature not over 105°C and express the result as *soda soap* (unsaponified and unsaponifiable matters are included

[1]Tentative Standard Methods for the Sampling and Analysis of Commercial Soaps and Soap Products. Jour. Ind. Eng. Chem., 11, 8, 785-88, (1919).

and should be deducted if separately determined). Deduct the weight of sodium oxide (Na_2O), already calculated, from the weight of soda soap to obtain the weight of *fatty anhydride.*

The data on thirty-eight samples of laundry and toilet soaps are summarized in Table XIV.

There are no official specification or standards for soap in this State. Standards formulated by various Government Departments and by private enterprises differ considerably in their requirements but the following specifications relating to laundry and toilet soaps may be quoted from a set of Government regulations:[1]

Laundry Soap, (for use with soft water). Moisture must not exceed 20 per cent.; volatile matter at 105°C. not more than 34 per cent.; free alkali (as NaOH) not more than 0.2 per cent.; alakline salts, as Na_2CO_3, not more than 1.0 per cent.; insoluble in water not more than 0.1 per cent.; rosin not more than 15 per cent.

Laundry Soap (for use with moderately hard water). Moisture must not exceed 20 per cent.; volatile at 105°C., not more than 34 per cent.; free alkali, as NaOH, not more than 0.5 per cent.; alkaline salts, as Na_2CO_3, not more than 6 per cent., nor less than 2.0 per cent.; insoluble in water not more than 0.5 per cent.; rosin not more than 25 per cent.

Milled (Toilet) Soaps. Volatile matter at 105°C. must not exceed 15 per cent.; free alkali, as NaOH, not more than 0.1 per cent.; alkaline salts, as Na_2CO_3, not more than 0.3 per cent.; insoluble in water nor more than 0.1 per cent.

White Floating Soap. Volatile matter at 105°C. must not exceed 34 per cent.; alkaline salts not more than 0.5 per cent.; otherwise the same as for milled soap.

Elsewhere[2] it is stated that a good grade of laundry soap will contain not less than 60 per cent. of fatty acids and not more than 0.5 per cent. free (caustic) alkali. Toilet soap should be free from caustic alkali, should not contain excess of water and should be free from loading material or filler.

The following *upper limits* for the several constituents of different types of toilet soaps may also be quoted.[3]

	Free alkali NaOH.	Alkali as Na_2CO_3.	Free fatty acids as oleic acid.	Insoluble matter.	Water.	Actual soap.
	%	%	%	%	%	%
Floating Soap	0.25	0.40	0.50	1.0	20.0	80.0
Transparent Soap.	0.10	0.10	0.25	0.3	15.0	75.0
Castile Soap	0.25	0.25	0.50	1.0	10.0	85.0
Milled Soap	0.10	0.30	0.25	1.0	10.0	85.0

It would appear from the foregoing and other data that above 20 per cent. of water in any hard soap is rather excessive; that free alkali should be present in but very small amounts if present at all; that free fatty acids should not greatly exceed 0.5 per cent. although

[1]Dept. of Commerce, Bureau of Standards, Circ. 62, (1916).
[2]Canada Inland Revenue Dept., Bull. 408, 1918.
[3]No. Dakota Food Dept., Special Bull., IV, 2, (1916).

TABLE XIV.—ANALYSES OF

Station No.	Brand.	Manufacturer.	Weight of Cake.	Cost of Cake.
	Laundry Soaps.		ozs.	cts.
11959	Best	B. T. Babbitt	8.2	7
12552	Bee	Colgate and Co	9.1	8
11971	Sunny Monday	N. K. Fairbanks Co	7.4	6
11960	Ozone	Fairchild & Sheldon Co	7.9	6
11963	Naptha	Fels & Co	8.6	7
11968	Borax	Kendall	8.8	5
11961	Borax	Kirkham	10.7	6
12551	Lenox	Proctor and Gamble Co	8.6	8
12550	Star	Proctor and Gamble Co	9.1	8
11972	White Naptha	Proctor and Gamble Co	9.1	8
11962	Arrow Borax	Swift & Co	9.2	7
12554	Pride	Swift & Co	8.6	7
11970	U. S. Mail	Globe Soap Co	8.2	6
12548	Welcome Borax		8.9	8
	Toilet Soaps.			
13178	Miona Witch Hazel	Armour and Co	2.4	5
13177	Venetian Verbena	Armour and Co	4.6	10
13194	Castile	Cincinnati Soap Co	2.2	5
13193	Monarch Oatmeal	Cincinnati Soap Co	2.5	5
13192	Sternes Buttermilk	Cincinnati Soap Co	2.3	5
13191	Sternes 47 Transparent Glycerine	Cincinnati Soap Co	2.0	5
13188	Coleo	Colgate and Co	2.9	10
13182	Palm	Colgate and Co	3.4	10
13176	Lucerne Rose	Crystal Soap Co	3.4	10
12555	Pearl	Globe Soap Co	4.7	6
11969	White Rose	Globe Soap Co	3.5	5
13206	Oatmeal	Holman Soap Co	4.6	10
13207	Pure	Holman Soap Co	6.4	10
13185	Violet Glycerine	Jergen	2.6	10
13180	Glycerine	J. S. Kirk and Co	3.8	10
13187	Jap Rose, Glycerine	J. S. Kirk and Co	3.8	10
13189	Harmony Rose, Glycerine	Liggetts & Co	4.2	15
13181	Rose Bath	Palmolive Co	2.7	5
15263	Ivory	Proctor and Gamble Co	4.6	10
13179	Oatmeal	John T. Stanley	1.9	5
13184	Violet Spray Glycerine	Mm. Waltke & Co	4.3	10
13190	Jersey Cream	J. B. Williams Co	3.6	15
13186	Florentine Carnation	A. B. Wrisley Co	2.8	10
12553	Lifebuoy	Lever Bros. Co	3.9	10

SOAPS.

Station No.	Actual Soap in Cake.	Actual Soap Cost per Ounce.	Loss on Drying.		Fat and Unsaponifiable.	Free Fatty Acids as Oleic Acid.	Alkali, as Na_2O combined as		Fatty and Resin Anhydrides.	Actual Soap.	Insoluble in Alcohol and Water.
			at 100°C.	in vacuum at 20°C.			Carbonate, Silicate, etc.	Soap.			
	ozs.	cts.	%	%	%	%	%	%	%	%	%
11959	5.1	1.4	25.56	....	4.27	0.42	2.30	7.70	54.71	62.41	2.26
12552	5.6	1.4	27.94	....	1.89	none[1]	1.42	8.96	52.56	61.52	0.50
11971	4.5	1.3	14.03	....	1.16	0.28	4.79	6.51	54.96	61.47	3.65
11960	5.7	1.1	20.17	....	2.92	0.28	0.50	8.79	62.87	71.66	0.33
11963	4.8	1.5	22.96	....	3.36	0.23	1.18	8.35	47.31	55.66	9.59
11968	6.1	1.2	22.90	....	1.69	0.23	1.15	8.77	60.30	69.07	1.63
11961	7.1	1.2	25.33	....	2.34	0.57	0.56	8.51	57.80	66.31	0.05
12551	5.2	1.5	23.04	....	6.45	0.14	1.73	8.62	52.26	60.88	2.68
12550	6.5	1.2	19.54	....	2.23	0.71	1.26	9.14	62.61	71.75	1.12
11972	4.7	1.7	17.92	....	0.42	0.28	6.97	5.18	46.97	52.15	0.80
11962	6.9	1.0	19.64	....	3.35	0.28	0.71	9.29	65.51	74.80	1.18
12554	5.6	1.3	20.74	....	4.72	3.63	0.22	9.94	56.63	66.57	5.38
11970	5.1	1.2	18.88	....	1.28	0.28	3.13	8.88	53.77	62.65	4.50
12548	6.3	1.3	16.53	....	1.73	0.85	2.30	7.65	63.10	70.75	1.40
13178	2.2	2.3	....	4.27	....	1.01	0.11	9.98	80.97	90.95	0.80
13177	4.2	2.4	....	4.95	....	0.42	0.06	10.02	81.81	91.83	0.56
13194	1.8	2.8	....	3.76	....	none[2]	0.20	9.45	72.97	82.42	10.80
13193	1.9	2.6	....	5.66	....	none[2]	0.18	9.00	67.80	76.80	14.53
13192	1.9	2.6	....	4.37	....	none[2]	0.17	9.32	74.48	83.80	8.28
13191	1.3	3.9	11.21	6.70	....	0.67	0.06	7.87	56.29	64.16	0.12
13188	2.7	3.7	4.55	4.25	....	0.56	0.10	10.52	83.42	93.94	0.48
13182	3.2	3.1	4.63	4.63	....	none[2]	0.13	10.46	83.43	93.89	0.10
13176	2.1	4.8	....	7.52	....	none[2]	0.72	7.15	54.29	61.44	0.20
12555	3.9	1.5	8.39	....	0.46	0.42	0.47	10.71	72.44	83.15	1.45
11969	3.0	1.7	6.60	....	0.65	0.23	0.16	10.92	73.42	84.34	1.20
13206	4.1	2.4	....	5.51	....	0.45	0.30	10.08	79.70	89.78	1.44
13207	5.5	1.8	....	3.58	....	none[2]	0.07	9.70	77.48	87.18	6.26
13185	1.7	5.9	9.92	8.23	....	2.14	none	7.81	58.62	66.43	0.12
13180	3.5	2.9	....	6.42	....	none[2]	0.10	10.30	80.94	91.24	0.80
13187	2.5	4.0	10.16	7.37	....	none[2]	0.41	7.68	57.68	65.36	0.02
13189	2.7	5.6	13.31	8.29	....	none[2]	0.26	7.68	57.62	65.30	0.08
13181	2.4	2.1	....	5.65	....	none[2]	0.30	10.27	79.27	89.54	0.70
15263	4.1	2.4	....	9.25	....	0.67	0.08	10.58	78.46	89.04	0.50
13179	1.7	2.9	....	5.96	....	none[2]	0.11	10.11	80.19	90.30	4.72
13184	2.6	3.8	....	8.09	....	none[2]	0.44	7.05	52.90	59.95	0.06
13190	3.4	4.4	5.11	3.87	....	none[2]	0.24	10.39	83.07	93.46	0.18
13186	2.6	3.8	5.02	4.76	....	0.45	0.10	10.27	81.43	91.70	1.18
12553	3.3	3.0	10.25	....	1.18	0.56	0.12	8.38	76.63	85.01	0.05

[1]Free alkali trace.
[2]Free alkali none.

many specifications omit any reference to this item from which we might infer that it was not of serious consequence; that alkali combined in forms other than soap and free alkali, i.e., as carbonate, etc., is not undesirable and that the limits vary depending upon the purpose for which the soap is intended; that matter insoluble in water should not exceed about 1 per cent. (much less in toilet soap according to some specifications); and that resin is permissible[1] as a fatty substitute and its soap equally considerable with fatty soap as a detergent.

In interpreting the results summarized in Table XIV, several points should be kept in mind. As already explained loss on drying at 100°C. includes matter which is volatile at that temperature. Drying in vacuum at room temperature approaches more nearly the true water content although alkaline carbonates and silicates will still retain some moisture. Although unsaponified fat and unsaponifiable material have not been determined in all of the toilet soaps the amounts present will be small, generally not exceeding 1.0 per cent. Free alkali is regarded as free caustic alkali, a trace being found in only one sample. Alkali combined as carbonate, silicate, etc., is expressed, in some analyses, as sodium carbonate. We have expressed alkali in these forms as sodium oxide, but the figures can be interpreted as hydrated sodium carbonate by multiplying the figures as given in the table by two. In the case of toilet soaps the fatty and resin anhydrides include fat and unsaponifiable matter which were not separately determined, but the small amount of such material usually present will not substantially alter the figures given. The estimates of cost per ounce of actual soap are based upon the prices actually paid for samples at the time of purchase, but all of the laundry soaps and some of the toilet soaps were purchased in 1919 when the price of soap was abnormally high and somewhat higher than at present, although pre-war prices do not yet prevail.

The analyses indicate that free caustic alkali is not so generally present in soaps as many suppose. The liberation of free alkali by hydrolysis in solution is automatically corrected, to some extent at least, by the presence of free fatty acids which tend to neutralize it as formed. We understand that it is for this purpose that the practice of introducing an excess of fatty material ("superfatting") is adopted.

The losses sustained by the laundry soaps at 100°C. although above 20 per cent. in a number of samples cannot be said to be excessive since the loss is not entirely due to water. The toilet soaps have shown uniformly less than 10 per cent. of moisture.

The limits for free fatty acids judged by the specifications and standards cited are not conspicuously exceeded except in sample **12554.**

[1]Lewkowitsch, II, p. 1073.

The actual soap, taken as the sum of fatty and resin anhydrides and alkali combined as soap, has been found to be between 60 and 70 per cent. as a rule in the case of laundry soap and generally above 80 per cent. in toilet soaps. Marked deficiencies in this respect in soaps of the latter type are due in part to glycerine and ingredients such as alcohol and sugar which enter into the composition of transparent soaps.

Insoluble matter in the laundry soaps is in most cases much higher than the specifications we have cited. This consists largely, or in part, of insoluble silica. Several of the toilet soaps show high percentages of insoluble matter due perhaps to siliceous matter added to increase detersive properties, or inert material such as starch, talc, etc. The cost of actual soap in products for laundry purposes is seen to vary between one cent and one and one-half cents per ounce, this upper limit being exceeded in only one case. The range is greater in the toilet soaps, the cost varying from one and one-half to about six cents per ounce. It will be noticed that no high-priced fancy soaps are included in the list.

Six miscellaneous samples of soaps have also been examined.

13943. *Cucumber Cream Soap,* made by U. S. Soap Co., New York, was found to contain 16.8 per cent. of water, 22.2 per cent. of fatty anhydrides and 3.4 per cent. of alkali (as Na_2O) combined as soap. It contained 25.6 per cent. of actual soap. Judging from the size of the wrapper the cake, as examined, was only about two-thirds of the original size indicating a large amount of water in the fresh soap.

15137, 15138, 15144. These soaps were examined for the Department of Entomology. They contained in the order named approximately 2.5 per cent., 4.19 per cent. and 35.6 per cent. actual soap.

14221, 14222. *Toilet Soaps.* Samples sent by the Department of Health, Bridgeport. They contained respectively 47.3 per cent. and 46.4 per cent. mineral matter insoluble in water.

TOILET PREPARATIONS.

The following samples were submitted by the Dairy and Food Commissioner.

16863. *Bay Rum.* Made by Wm. H. Loveland Co., Binghampton, N. Y., was declared to contain 20 per cent. of alcohol but was found to contain only 10.48 per cent. No. **16765** was passed. Neither contained wood alcohol.

17130. *Empress Instantaneous Hair Color Restorer,* Dark Brown shade and **17019**, the same name but a black shade. The Empress Manufacturing Co., Inc., New York.

Examination was as follows:

17130, bottle 1, contained paraphenylene diamine; bottle 2 contained 2.28 grams hydrogen dioxide per 100 cc. of solution.

17019, bottle 1, contained paraphenylene diamine and bottle 2 contained 1.16 grams hydrogen dioxide per 100 cc. of solution.

Paraphenylene diamine is a dangerous compound on account of its poisonous properties. Hair dyes, under other names, consisting of the same components as found in this one have been noted before[1].

The manufacturer claims that the danger attending the use of paraphenylene diamine is removed by the use therewith of an oxidizing agent such as hydrogen peroxide. However this may be, the evidence based upon reported injuries following the use of such preparations is that the combination does not work out satisfactorily in practice.

16939. *Liquid Silmerine.* Made by Parker, Belmont & Co., Chicago.

The sample was examined as follows:

Constituents are in grams per 100 cc. Solids 1.91; ash 1.26 (sodium carbonate and borate present); precipitable by alcohol 1.07 (uncorrected for ash).

16938. *Pepsodent.* Made by the Pepsodent Co., Chicago. Only alcohol was determined. It contained 1.52 per cent. alcohol by weight, no methyl alcohol present.

NOTE.

A request for a re-examination of our records in case of samples No. **14842,** Quinol Hair Tonic and No. **14872,** Lily of the Valley Toilet Water was received from the Colgate Company of New York. Examination of these preparations, Bulletin 219 of this Station, pp. 250 and 251, showed them to contain respectively 29.16 per cent. and 67.65 per cent. of alcohol by volume. The manufacturers claimed that careful control of these products was maintained and regularly showed 35 per cent. and 70 per cent. respectively. Our records show that duplicate determinations were made in case of **14842**, because of the variation, and that these were in close agreement; and no error was found in the record of sample **14872.** However, new samples of the preparations named were procured in the market by our Station agent and alcohol determined. Quinol Tonic was found to contain 34.85 per cent., and Lily of the Valley Toilet Water 68.56 per cent. of alcohol.

The Colgate Company was advised of our new results; but we are unable to find our original figures in error.

[1]Conn. Exp. Sta. Report 1914, p. 289; Report of Chem. Laby., Am. Med. Assoc., 1910, p. 111.

UNITED STATES PHARMACOPOEIA DRUGS.

TINCTURE OF CINCHONA AND TINCTURE OF CINCHONA COMPOUND.

The United State Pharmacopoeia prescribes that Tincture of Cinchona shall contain in 100 mils of solution not less than 0.8 gram nor more than 1.0 gram of alkaloids of Cinchona; and that Tincture of Cinchona Compound shall contain in a similar volume not less than 0.4 gram nor more than 0.5 gram of such alkaloids.

Seven samples of straight tincture and twenty-four of compound have been examined for the Dairy and Food Commissioner. The results are as follows:

TABLE XV.—ASSAYS OF TINCTURE OF CINCHONA AND TINCTURE OF CINCHONA COMPOUND.

D. C. No.	Manufacturer or Dealer.	Alkaloids, gram. per 100 cc.
	Tincture of Cinchona.	
16950	*Bristol:* The Madden Drug Store	0.92
16752	*Danielson:* W. E. LaBelle	0.42
16923	*Hartford:* The Goodwin Drug Store	0.83
16598	*Norwich:* John A. Dunn	0.83
16582	*Putnam:* James F. Donahue	0.95
16862	*Waterbury:* Apothecaries Hall	0.78
16574	*Willimantic:* G. O. Cartier	0.61
	Tincture of Cinchona Compound.	
16851	*Bristol:* The Madden Drug Store	0.41
16703	*East Hartford:* W. B. Noble	0.54
16719	*Glastonbury:* The Peoples Pharmacy	0.36
16922	*Hartford:* The Goodwin Drug Co	0.49
16885	*Meriden:* N. P. Forcier	0.59
16758	*Mystic:* Edw. W. Gaskell	0.29
16771	*New London:* Dr. A. Crocicchia	0.35
16769	L. P. Desmarais	0.28
16762	James Drug Store	0.82
16600	*Norwich:* John A. Dunn	0.67
16593	Pitcher & Service	0.80
16586	*Putnam:* Ed. H. Burt	0.38
16583	James F. Donahue	0.46
15887	*Rockville:* Metcalfs'	0.51
15895	Thomas Pharmacy	0.57
16728	*South Manchester:* J. H. Quinn & Co	0.37
16723	T. Weldon & Co	0.45
16737	*Stafford Springs:* D. H. McCormick	0.37
15879	*Thompsonville:* Wm. J. O'Brien	0.33
16860	*Waterbury:* Apothecaries Hall	0.31
16868	H. W. Lake Drug Co	0.50
16575	*Willimantic:* G. O. Cartier	0.43
16886	*Winsted:* F. B. Bannon	0.42
16891	G. L. Fancher	0.48

In 12 cases the preparations are within the United States Pharmacopoeia limits.

In 7 cases the variations are less than 10 per cent. of the standards; in 12 cases they exceed 10 per cent. Several preparations

would be satisfactory if correctly labeled. For example, No. **16752** is low for a straight tincture, but is within the limits for a compound, while Nos. **16593** and **16762** are too high for compounds, but would pass for straight tinctures. As they stand however, they must be classed as adulterated.

Solution of Hydrogen Dioxide.

The United States Pharmacopoeia requires that this preparation shall contain not less than 3 per cent. by weight of hydrogen dioxide (H_2O_2).

Among other specifications are the following:

Not more than 0.03 gram of solid residue remains on evaporating 20 mils of solution to dryness; and not more than 2 mils of N/10 potassium hydroxide are required to neutralize 25 mils of the solution.

Results of our analyses of twenty-three samples are as follows:

Table XVI.—Assays of Hydrogen Dioxide.

D. C. No.	Brand.	Hydrogen dioxide. %	Solids, gm. per 20 cc.	Acidity, cc N/10 KOH per 25 cc. solution.
16595	A. D. S	3.62	0.021	1.80
16877	Albany Chemical Co	3.07	0.024	2.50
16705	Brewer & Co	3.29	0.015	1.88
16754	Brewer & Co	3.04	0.015	2.25
16883	Brewer & Co	3.03	0.057	5.00
16772	Butler Bros	3.02	0.022	1.38
16893	Earle & Co	3.07	0.016	1.65
15885	Eastern Drug Co	3.07	0.026	1.25
16770	Eimer and Amend	3.18	0.024	1.88
16920	Goodwin's Drug Store	3.08	0.018	2.88
16590	Mallinckrodt Chemical Works	2.88	0.037	1.38
15897	Mallinckrodt Chemical Works	3.05	0.024	0.63
16711	Mallinckrodt Chemical Works	3.00	0.033	1.38
16724	Mallinckrodt Chemical Works	3.05	0.023	0.75
16596	Merck & Co	2.95	0.030	1.38
16866	National Peroxide Co	3.15	0.024	1.63
16579	Oakland Chemical Co	3.74	0.008	0.65
16571	Parke, Davis Co	3.08	0.017	1.85
16716	Parke, Davis Co	3.16	0.024	2.13
16735	Parke, Davis Co	3.11	0.025	2.25
16852	Parke, Davis Co	3.20	0.025	1.63
15869	Powers-Wightman-Rosengarten Co	3.09	0.023	1.38
16751	Powers-Wightman-Rosengarten Co	3.01	0.029	2.38

All of the samples meet the requirement as to actual hydrogen dioxide or come within reasonable limits thereof, or of the declared strength; but several show excess of solids or of acidity or both. Since it has been found that the exact manipulation of the Pharmacopoeia method for acidity gives uncertain results in some

cases, a modified proceedure[1] has been followed in case of samples showing high acidity.

Samples **16920, 16877, 16751, 16735,** and **16754** are in excess of the Pharmacopoeia specifications for acidity by more than 10 per cent.; **16590** is in excess in solids; and **16883** is greatly in excess both as regards acidity and solids.

Lime Water.

The United State Pharmacopoeia requires that this solution shall contain not less than 0.14 per cent. of calcium hydroxide when prepared at 25°C.

The percentage of calcium hydroxide varies somewhat with the temperature at which the solution is prepared being about 0.17 per cent. at 15°C. and diminishing as the temperature rises.

Thirty-two samples were examined for the Dairy and Food Commissioner of which twenty-five met the requirements and seven were deficient. The deficient samples ranged from 31.4 per cent. to 81.0 per cent. of standard strength.

The results are as follows:

Table XVII.—Assays of Lime Water.

D. C. No.	Manufacturer or Dealer.	Calcium hydroxide, per cent.
16942	*Bristol:* Perry N. Holley	0.173
16949	The Madden Drug Store	0.150
16753	*Danielson:* W. E. LaBelle	0.146
16704	*East Hartford:* W. B. Noble	0.101
16712	O'Connell Drug Co	0.159
16717	*Glastonbury:* The People's Pharmacy	0.145
16919	*Hartford:* The Goodwin Drug Co	0.106
16756	*Jewett City:* Charles R. Carey	0.179
16876	*Meriden:* W. W. Mosher	0.178
16881	Charles H. Pinks	0.167
16884	N. P. Forcier	0.054
16937	*Middletown:* John J. Cronin	0.178
16760	*Mystic:* Edward Gaskell	0.190
16853	*New Britain:* Crowell's Drug Store	0.176
16767	*New London:* J. Burro	0.185
16592	*Norwich:* P. F. Bray	0.114
16597	George M. Rathborn	0.179
16585	*Putnam:* James F. Donahue	0.142
16589	E. H. Burt	0.179
15886	*Rockville:* Metcalf's	0.077
15896	Thomas Pharmacy	0.044
16730	*South Manchester:* J. H. Quinn & Co	0.155
16738	*Stafford Springs:* D. H. McCormick	0.169
16743	Ethel H. Wickes	0.170
15872	*Thompsonville:* George R. Steele, Est	0.179
15878	William J. O'Brien	0.165
16858	*Waterbury:* Apothecaries Hall	0.058
16870	H. W. Lake Drug Co	0.169
16572	*Willimantic:* G. O. Cartier	0.163
16577	Charles DeVilliers	0.161
16890	*Winsted:* G. L. Fancher	0.174
16894	John A. Williams	0.165

[1]Conn. Exp. Sta. Report, 1909, p. 266.

Solution of Magnesium Citrate.

One hundred mils of this solution contains magnesium citrate corresponding to not less than 1.5 grams of magnesium oxide.

There is no direct numerical standard for citric acid, but according to the formula as given by the Pharmacopoeia one hundred mils should contain 9.4 grams of this ingredient.

Of the twelve samples examined for the Dairy and Food Commissioner only one failed to meet the required or declared strength as regards magnesium oxide. The following summary shows the results of assays compared with the requirements of the standard or special declarations.

Sample No. **16924** was assumed to be of standard strength, there being no declaration to the contrary, but it was found to be only 60 per cent. of standard. In cases where special declarations of quality or strength were made they were found to be substantially correct. The deficiencies in total citric acid may possibly arise from a part of the magnesium being derived from magnesium sulphate.

Table XVIII.—Assays of Solution of Magnesium Citrate.

D. C. No.	Manufacturer or Dealer.	Magnesium oxide, gms. per 100 cc. Required.	Found.	Free acid, as citric, gms. per 100 cc.	Total citric acid, gms. per 100 cc. Required.	Found.
16710	*East Hartford:* O'Connell Drug. Co	1.5	2.11	3.85	9.4	10.40
16924	*Hartford:* The Goodwin Drug Co.	1.5	0.90	1.87	9.4	5.78
16761	*Mystic:* Edward W. Gaskell	1.5	1.71	3.29	9.4	9.94
16857	*New Britain:* Crowell's Drug Store	1.5	1.69	2.91	9.4	9.39
16773	*New London:* Dr. A. Crocicchia	1.5	2.06	1.21	9.4	8.79
16594	*Norwich:* Pitcher & Service	0.9	0.94	1.70	5.6	5.45
16588	*Putnam:* E. H. Burt	1.3	1.26	0.62	5.4	5.37
15888	*Rockville:* Metcalf's	1.5	1.42	2.55	9.4	7.46
16736	*Stafford Springs:* D. H. McCormick	1.5	1.62	2.32	9.4	8.07
15871	*Thompsonville:* George R. Steele, Est	1.5	1.52	4.03	9.4	7.98
16859	*Waterbury:* Apothecaries Hall	0.8	0.87	2.48	...	6.09
16576	*Willimantic:* Charles DeVilliers	0.8	0.77	1.28	...	3.99

Tincture of Nux Vomica.

The United States Pharmacopoeia requires this preparation to contain not less than 0.237 gm. nor more than 0.263 gm. of the alkaloids of nux vomica.

Twenty-five samples were submitted by the Dairy and Food Commissioner for examination. Only three were found to be within the prescribed limits of 0.237 to 0.263. Ten others, however, varied from these limits by less than 10 per cent. while six more were but slightly in excess of 10 per cent. variation. Of the

remaining six samples four were deficient, ranging from 0.160 gm. to 0.182 gm. per 100 cc., one was considerably over strength and one was not reported as there was not sufficient material to check the original assay which showed a deficiency.

The results are as follows:

TABLE XIX.—ASSAYS OF TINCTURE OF NUX VOMICA.

D. C. No.	Manufacturer or Dealer.	Alkaloids of Nux Vomica gm. per 100 cc.
16948	*Bristol:* The Madden Drug Store	0.160
16702	*East Hartford:* W. B. Noble	0.200
16713	O'Connell Drug Co	0.232
16718	*Glastonbury:* The Peoples Pharmacy	0.226
16918	*Hartford:* The Goodwin Drug Co	0.262
16755	*Jewett City:* Charles R. Carey	0.226
16759	*Mystic:* Edward W. Gaskell	0.211
16763	*New London:* J. H. James	0.440
16766	J. Burros	0.298
16768	E. Callahan	0.269
16591	*Norwich:* P. F. Bray	0.182
16599	John A. Dunn	0.204
16581	*Putnam:* J. J. Dupre	0.255
16584	James F. Donahue	0.160
16587	E. H. Burt	0.182
15889	*Rockville:* F. E. Metcalf	0.218
15894	Thomas Pharmacy	0.306
16729	*South Manchester:* J. H. Quinn & Co	0.226
15870	*Thompsonville:* George R. Steele, Est	0.226
16861	*Waterbury:* Apothecaries Hall	0.204
16869	H. W. Lake Drug Co	0.255
16573	*Willimantic:* G. O. Cartier	0.218
16578	Charles DeVilliers	0.226
16895	*Winsted:* John A. Williams	
16887	F. B. Bannon	0.264

SATURATED SOLUTION OF POTASSIUM IODIDE.

A prescription calling for a saturated solution of potassium iodide was presented by an Inspector of the Dairy and Food Commissioner's office at five different drug stores in four different cities in this state. Solutions ranging from 63.5 per cent. to 99.5 per cent. of saturation were obtained, judging saturation by the solubility of the salt at 20°C. The amount of salt in a saturated solution varies with the temperature at which the solution is made. Thus a solution saturated at 25°C. should contain 59.7 per cent. of the salt; if saturated at 0°C. only 56.0 per cent. would be present. The usual range in temperature of "cold water" used in official formulas is taken to be 15° to 25°[1] and we therefore chose the mean of these, or ordinary room temperature, saturated at which a solution should contain 59.0 per cent. of potassium iodide[2].

The results of the assays are given in Table XX.

[1]U. S. P. IX, p. XLIX.
[2]Seidell, (1907) p. 252.

TABLE XX.—ASSAYS OF "SATURATED" SOLUTION OF POTASSIUM IODIDE.

D. C. No.	Druggist.	Potassium iodide in solution, per cent.	Degree of saturation, per cent.
15787	*Bridgeport:* Julius Ginsbert	58.74	99.5
18401	*Hartford:* Kaufman's Pharmacy	42.42	71.9
15786	*New Haven:* A. Harowitch	37.45	63.5
15850	*Norwich:* D. T. Salesser	50.91	86.3
15851	Smith Pharmacy	54.93	93.1

These results are surprising when one considers that a saturated solution of the salt is very easy to prepare, and that specific information as to its solubility is given in the Pharmacopoeia. Yet three of the solutions show varying degrees of carelessness in preparation.

HAMAMELIS (WITCH HAZEL) WATER.

Among other specifications in the United States Pharmacopoeia this preparation contains not less than 14 per cent. of alcohol, by volume and should not respond to tests for methyl alcohol.

Eleven samples have been examined for the Dairy and Food Commissioner and determinations of alcohol and tests for methyl (wood) alcohol made. No wood alcohol was found in any case and in only one, No. **15863,** was substantially less than the required or declared amount of alcohol found.

The results are as follows:

TABLE XXI.—INSPECTION OF HAMAMELIS (WITCH HAZEL) WATER.

D. C. No.	Manufacturer or Dealer.	Alcohol by volume per cent.	Methyl alcohol.
16757	J. R. Carey, Jewett City	14.04	none.
15863	Childs, New York	7.88	none.
16580	Charles DeVilliers, Willimantic	14.20	none.
15875	E. E. Dickenson, Essex	14.00	none.
15893	E. E. Dickenson, Essex	14.60	none.
16706	E. E. Dickenson, Essex	14.28	none.
16725	E. E. Dickenson, Essex	14.40	none.
16943	E. E. Dickenson, Essex	14.20	none.
16915	Goodwin's Drug Store, Hartford	14.04	none.
16865	Salem Chemical and Supply Co., Salem, Mass	14.36	none.
16739	The Sisson Drug Co., Hartford	14.48	none.

MISCELLANEOUS DRUGS, ETC.

Twenty-four samples of miscellaneous materials have been submitted chiefly by health officials and physicians. Two of these were unofficial samples from the Dairy and Food Commissioner's office.

D. C. No. **17042.** *Furniture Polish.* The preparation was found to be a mixture of cottonseed oil and denatured alcohol in the

approximate proportions of 90 parts of oil and 10 parts of alcohol.

D. C. No. **15788**. *Essence of Peppermint.* It contained 82.20 per cent. of alcohol, by volume. No methyl alcohol was detected.

14442 and **14395**. *Turpentine.* Neither sample was found adulterated.

14442. Specific gravity at 15.6°C. 0.8851; color white, yellowish; polymerization residue 0.7 per cent.

14395. Specific gravity at 15.6°C. 0.8774; color white; polymerization residue 0.7 per cent.

14406. *Tablets* submitted by a physician for identification were found to contain morphine.

14457. *Pills* submitted by a physician were found to contain codeine.

14622. *Pills* submitted by a physician were found to contain 46.2 per cent. of sodium bicarbonate and 46.1 per cent. of milk sugar. No other medicament was found.

14631. *Tablets* submitted by a physician. These were hypodermic tablets of morphine sulphate, 1/4 grain, and atropine sulphate 1/150 grain. We were requested to determine the variation in gross weights and in weights of medicament.

Twenty-five tablets examined. Minimum weight 0.0244, maximum 0.0274, average 0.0257 gram.

Two groups of three tablets each assayed. Total alkaloid found (1) 0.0160 and (2) 0.0150 gram as morphine sulphate per tablet or 0.246 and 0.230 grain per tablet as compared with 0.256 grain total alkaloid declared.

The tablets were satisfactory both as regards variation in weight and medicament.

14805. *White tablets* submitted for identification. They were found to be morphine hydrochloride.

15336 and **15337**. *Liniment.* Samples submitted by New Haven County Health Officer.

Examinations: **15336.** Reaction alkaline; solids 13.40 grams per 100 cc.; ash 5.58; arsenic (As.) 2.53; vegetable extractives present, unidentified; alcohol none.

15337. Reaction acid; solids 1.98 grams per 100 cc.; ash 0.45; gallic or gallotannic acids indicated.

The first preparation is a water solution containing a relatively large amount of arsenic as the most conspicuous ingredient. The second sample was also a water solution consisting of, or containing, gallic or gallotannic acids or both.

14697, 14698, 14699. *Unknown Drugs,* submitted by the City Health Department, Bridgeport. Two samples were boric acid and the third was potassium permanganate.

15066. *Medicine,* submitted by the County Health Officer, Bridgeport. The sample was greyish white in color, with a salty taste but not bitter. It was found to consist of 98.3 per cent.

bicarbonate of soda and 1.7 per cent. of material insoluble in dilute acid largely or entirely vegetable material, unidentified, but resembling cardamon.

15104. *Medicine,* with prescription submitted by the County Health Officer of Bridgeport. The prescription proved to be too complicated to detect or determine all of the eight ingredients. So far as we could discover, however, there was no evidence that the preparation was not of the substance and quality demanded.

14287. *Saccharin tablets,* were found to consist of saccharin and milk sugar.

15338. *Hair Dye* said to be Canute Water but not submitted in original container.

The amount of material was only 10cc. but it was found to be an alkaline solution of silver nitrate.

14049, 14681. *Arsenate of Lead.* The first was submitted by Dr. Britton, State and Station Entomologist, the second by Mr. Fay, County Agent for Middlesex County.

Analyses:	14049	14681
	%	%
Moisture	0.40	.....
Lead (PbO)	65.72	64.13
Arsenic (As_2O_5)	29.18	32.66

15182. *Hexpo,* Smith's, Insecticide and Fungicide.

Analysis in parts per 100:

Moisture 5.65; silica 0.80; sulphuric acid (SO_3) 20.84; copper (metallic) 16.62; lead (PbO) 17.70; arsenic (As_2O_5) 8.10.

The mixture consists of about two-thirds copper sulphate and one-fourth lead arsenate.

15090. *Lime Sulphur Solution.* The specific gravity at 20°C. of the solution was 1.3073 equivalent to 34.1 Baumé. This is somewhat above the average density (24° to 25°).

13647. *Linseed Oil.* The sample was found to contain lead and mineral oils.

15038. *A Veterinary Preparation* said to be Stark's Reducine was found to consist essentially of a fatty base with iodides and tar.

MOTOR GASOLINE.

Gasoline generally signifies a product of crude petroleum produced by the process of distillation. This is called straight refinery gasoline. Newer types are the so-called casing-head gasoline, produced from natural gas by compression or other processes, and "cracked" or synthetic gasoline produced from heavy oils of the kerosene type by the "cracking" process. Both of these products are important factors in the present motor fuel supply but neither is generally sold as such but in the form of blends.

Gasoline is not a definite chemical substance like water or alcohol but a mixture of hydrocarbon compounds in varying proportions. The most essential characteristic of gasoline is its property of rapid vaporization which is shown and measured by determining the distillation range of the fluid. It should not contain too large a proportion of low boiling constituents, a condition which results in undue loss and danger in handling and in storage. These light fractions are the most expensive constituents in gasoline and it is therefor desirable from the standpoint of economy to include as large a proportion of the heavier and higher boiling constituents as the vaporizing power of the engine will permit. The motor derives its power from the heat of combustion of fuel. This is measured in terms of British thermal units (so-called B.T.U's.) and varies within rather narrow limits for the different varieties of gasoline. For this reason the calorific power is not generally determined in routine tests. Specific gravity alone, expressed in Baumé degrees, and generally referred to as the "test," has no significance, as an index to the substance and quality of gasoline.

Chapter 166 of the Public Acts of 1919 relates to the sale of adulterated or inferior products as gasoline. The term "gasoline" as used in the Act is construed to mean "only gasoline which has not been adulterated and with which there has been made no addition, combination or mixture of any other article after it has passed from the ownership of the manufacturer." No standards or specifications are defined in the Act.

Arrangement was made with the Commissioner of Motor Vehicles to test samples of gasoline in this laboratory, but no official samples have been received. Anticipating such work, a few preliminary tests were made of the common market brands. The apparatus and methods used were as described and recommended in Technical Paper 214, Bureau of Mines; and the specifications for distillation range those adopted by the Committee on Standardization of Petroleum Specifications effective November 25th, 1919.[1]

These specifications are as follows:

(a) Initial boiling point not higher than 60°C. (140°F.); (b) 20 per cent. of sample must distill below 105°C. (221°F.); (c) 50 per cent. must distill below 140°C. (284°F.); (d) 90 per cent. must distill below 190°C. (374°F.); (e) end or dry point must not exceed 225°C. (437°F.); (f) not less than 95 per cent. will be recovered in the receiver from the distillation.

The actual *distillation loss* is the difference between the original volume taken (100cc.) and the sum of the volumes of the distillate and of the residue left in the distillation flask.

Data obtained on 15 samples examined are summarized in Table XXII.

[1]. Oil and Gas Jour. **18**, 26, 62 1919. Chem. Absts., **14**, 3, 342 1920.

TABLE XXII.—EXAMINATION OF MOTOR GASOLINE.

No.	Date 1920.	Brand.	Color.	Sp. Grav., degrees Baumé 15.6°C.	Acidity, cc N/10 alkali per 100 cc gasoline.	Distillation range, degrees, Centigrade.					
						Initial b.p., first drop.	20% distilled at or below.	50% distilled at or below.	90% distilled at or below.	End point.	Distillation loss, per cent.
Standards or Limits.			**Water white**	....	**none**	**60**	**105**	**140**	**190**	**225**	...
13200	3/17	Atlantic	white	61.0	none	35	89	130	187	223	1.0
13948	8/25	Atlantic	white-yel'sh	60.5	none	41	86	127	184	218	0.3
13195	3/17	.....	white	58.4	none	45	96	116	160	192	0.3
13949	8/25	.....	white-yel'sh	57.2	none	47	100	135	189	220	0.8
13197	3/17	Goodrich	white	60.7	none	40	91	125	185	220	0.5
13946	8/25	Goodrich	white	59.2	none	47	96	137	189	230	1.0
13199	3/17	Gulf	white	60.0	none	40	87	116	182	223	0.5
13951	8/26	Gulf	white	61.8	none	42	92	122	177	212	0.5
13945	8/25	Gulf	white	60.5	none	44	90	119	181	218	0.4
13950	8/25	Socony	white	57.3	none	39	96	135	189	220	0.1
13198	3/17	Standard	white	59.7	none	42	100	128	180	215	0.5
13196	3/17	Texas	white	57.9	0.1	48	99	130	188	223	0.5
13947	8/25	Texas	white	57.9	none	44	95	131	187	225	0.2
13201	3/17	Tydol	white	59.2	none	44	98	128	177	214	0.5
13959	8/25	Tydol	white	62.3	none	51	93	123	183	211	0.6

We are not prepared to discuss these results in terms of the relative desirability or efficiency of the several brands of gasoline represented. Efficiency of fuel utilization depends upon several or many factors other than the quality of the fuel itself. Practically all the samples meet the specifications and standards we have selected in all respects. No. **13946** is seen to exceed the end temperature by 5 degrees and the distillation residue in case of **13196** was slightly acid. It would appear, however, that of two gasolines with the differences shown between **13200** and **13959**, for example, one might be better adopted to a particular condition or purpose than the other. The first shows a larger proportion of the lighter and low boiling fractions together with about the limit of heavy constituents, while the second contains neither extreme. It would also appear that each product sampled at two different seasons of the year shows a reasonably satisfactory degree of uniformity of composition.

SUMMARY.

Materials.	Sampled by, or at request of			Total.	Adulterated, below standard or otherwise illegal.
	Station Agent.	Dairy and Food Commissioner.	Individuals.		
Foods.					
Carbonated Soft Drinks	9	189	0	198	63
Cereal Products:					
Breakfast foods	2	0	0	2	0
Health foods	0	0	3	3	0
Flour	0	4	4	8	2
Cider	0	2	4	6	0
Cocoa	0	1	3	4	0
Coffee	15	2	1	18	0
Desiccated Foods	8	0	0	8	0
Diabetic Foods	120*	0	7	127	....
Egg and Egg Products	10	0	27	37	0
Fats and Oils:					
Olive oil	0	2	3	5	0
Cooking fats	1	2	0	3	0
Butter	0	22	1	23	4
Oleomargarine	0	5	0	5	0
Nut margarine	2	0	0	2	0
Gelatin, etc	0	8	0	8	3
Ice Cream	0	400	4	404	48
Milk and Milk Products:					
Market milk	0	1,056	102	1,158	329
Cream	0	6	4	10	0
Imitation milk	3	0	0	3	0
Milk powder	4	0	0	4	0
Malted milk	4	0	2	6	0
Human milk	0	0	14	14	0
Syrup	0	0	2	2	0
Tea	7	0	0	7	....
Vinegar	0	1	9	10	3
Miscellaneous Materials:					
Foods, etc	5	0	8	13	....
Liquors	0	10	81	91	6
Other materials	0	7	38	45	....
Total	**190**	**1,717**	**317**	**2,224**	**395**
Drugs.					
Proprietary Remedies	5	0	0	5	....
Soap	38	0	6	44	2
Toilet Preparations	2	6	0	8	3
U. S. P. Drugs:					
Cinchona, Tincture of	0	7	0	7	2
Cinchona Compound, Tincture of	0	24	0	24	10
Hydrogen Dioxide	0	23	0	23	7
Lime Water	0	32	0	32	7
Magnesium Citrate, Solution of	0	12	0	12	1
Nux Vomica, Tincture of	0	25	0	25	11
Potassium Iodide, Saturated Solution	0	5	0	5	3
Witch Hazel Water	0	11	0	11	1
Miscellaneous Drugs, etc	0	2	22	24	....
Gasoline	15	0	0	15	....
Total	**60**	**147**	**28**	**235**	**47**
Total for Foods and Drugs	**250**	**1,864**	**345**	**2,459**	**442**

*Including 107 analyses in Bull. 220 and not included in Summary for 1919, (See Bull. 219, p. 259).