The 52nd Report on

FOOD PRODUCTS

And the 40th Report on

DRUG PRODUCTS, 1947

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CONTENTS AND SUMMARY

The Fifty-Second Report on FOOD PRODUCTS and the Fortieth Report on DRUG PRODUCTS 1947

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This report summarizes examinations of foods, drugs and cosmetics submitted by the Dairy and Food Commissioner, the Food and Drug Commissioner and the Commissioner of Farms and Markets during the calendar year 1947, as well as like materials analyzed for health departments and others. The numbers of samples of all kinds analyzed for other Federal, State and Station departments and not reported in other bulletins are also listed.

While this Station had published some analyses of foods since the first Station report in 1877, it was not until 1886, following the enactment by the 1885 legislature of a law to prevent the fraudulent sale of imitation butter, that a beginning was made in a systematic attempt to detect adulterated foods. This law of 1885 established a Dairy Commission whose duty it was to prosecute violations uncovered by the analyses of the Station. In 1895 the legislature passed a comprehensive pure food law; in 1907 a new law modeled after the Federal (Wiley) Act of 1906, bringing drugs within the scope of its provisions, was adopted; and in 1939 this law was revised to bring it into accord with the new U. S. Food, Drug and Cosmetic Act. Throughout all of this period and up to July 1, 1947, the Station cooperated with a succession of twelve Dairy and Food Commissioners in protecting the public of Connecticut from adulterated and misbranded foods and drugs.

By the terms of a law adopted by the 1947 legislature (Public Act No. 401) both the Dairy and Food Commission and the State Department of Agriculture were abolished. The Food, Drug and Cosmetic Act was not directly amended as such, and the Station retained its previous responsibilities under that act, namely, the duty of analyzing and reporting on samples submitted by the Commissioner and the joint responsibility with the Commissioner for the promulgation of regulations. However, two new commissions were set up in place of the former regulatory agencies. A new Food and Drug Commissioner was entrusted with the duties of the Dairy and Food Commissioner under the Food, Drug and Cosmetic Act, except as these duties related to milk or milk products (not including ice cream, frozen desserts or frozen dessert mix). Enforcement of the law in regard to milk was transferred to a new Commissioner of Farms and Markets.

The net result of these changes so far as the Station is concerned has been that since July 1, 1947 all food, drug and cosmetic samples except vitamin D milk have been received from and reported to a Food and Drug Commissioner instead of a Dairy and Food Commissioner, while the results of assays of vitamin D milk are reported to the Commissioner of Farms and Markets.

Sixteen hundred and seventy samples of foods, drugs, cosmetics and related materials were examined during the year. This was a very slight de-

crease from the all-time high of 1706 samples analyzed during 1946. The types of foods submitted by the Commissioner showed some change: There were 287 samples submitted for examination for insect infestation or rodent contamination as against only 36 in 1946; only 94 carbonated beverages instead of the 181 the previous year; nine samples of apples for spray residue instead of 136; and decreases in the number of samples of cheese, oils and vinegar. Some 33 samples of canned vegetables were submitted in 1947, while there were not enough of these products in 1946 to require a separate listing in the report.

The total number of samples examined from all sources was 2,232.

The only change in the department staff was the resignation of Mrs. Mary Van Camp, who served as aid to Mr. Mathis in running the spectrograph, on August 1.

The writer wishes to express his gratitude to all the members of the staff for their loyal and efficient work, the results of which are reported in these pages. During all of the period reported in this bulletin the former chemist in charge, Dr. E. M. Bailey, was a valuable source of advice when difficult questions of interpretation or judgment arose. It was a great loss, both personal and to the administration of the department, when he suddenly died on April 13, 1948; an obituary will appear in the 1948 Report.

FOODS

Baked Products

Fourteen samples of baked products were submitted by the Commissioner. Six were adulterated or misbranded.

One sample of egg noodles was examined only for labeling; of two cakes examined only for net weight, one was passed; the other, *E.S.1543, Old Fashioned Mocha Cake,* made by Bamby Bakers, Pawtucket, R. I., was 3.6 oz. short weight.

Four samples were examined because of claims for the presence of butter:

K.C.-382. Angonoa's Butter Breadsticks. A. Angonoa, Inc., New York, N. Y. Estimated butter fat content from Reichert-Meissl value of fat, 1.94 per cent. Sample was passed.

K.N.-1035 and E.S.-1538. Bond Honey-Butter Bread. General Baking Co., New York, N. Y. This bread was labelled as "made with honey, eggs, milk, cane syrup, butter". Analysis showed an average of 3.19 per cent butter fat present.

A.F.-790. Tastee Caramel Wheat. Starr Confections, Chicago, Ill. This product was claimed to be "Puffed wheat coated with sugar, fresh creamery butter added", and the declared ingredients were "sugar, wheat, corn syrup, butter, artificial flavor, salt and soda". Analysis showed a total oil content of 1.93 per cent; at least 56 per cent of this, or 1.08 per cent of the sample, was mineral oil. Not only was the ingredient declaration false, but the product was adulterated with mineral oil, which is not a permissible ingredient of any food.

Three other samples were tested for the presence of mineral oil:

K.F.-849. Pecan Fruit Bar. Texas Bakers, San Antonio, Texas. Declared ingredients on the bar were "flour, syrup, dextrose, shortening, eggs, raisins, pecans, leavening, salt, carotene, lecithin, artificial flavoring", but a slip of paper was also attached that read "Correction: This product contains less than 3 per cent non-nutritive oil". Analysis showed 1.43 per cent of mineral oil. Any food product containing mineral oil is adulterated even if the mineral oil is declared.

E.S.-1323. Skokie Farms Genuine Ice Box Cookies. Skokie Valley, Skokie, Ill. No mineral oil was found and sample was passed. Sample of these cookies examined in 1945[1] declared and contained mineral oil; apparently the use of mineral oil has been discontinued.

K.F.-803. Tick Tock Ice Box Cookies. R. J. Stevens Baking Co., Brooklyn, N. Y. No mineral oil was found and sample was passed.

Three other samples were tested as follows:

K.F.-1217. Cellu Soy Oat Cookies. Chicago Dietetic Supply House, Inc., Chicago, Ill. These cookies, which were intended primarily for diabetics, were labelled "A sugar-free cookie substitute". Declared ingredients were "oat flour, soy bean flour, hydrogenated vegetable fat, water, skimmed milk powder, freshly broken eggs, salt, soda bicarbonate, phosphate, vanilla flavoring and saccharin (0.31 grains in 100 grams)". There was also a declared analysis; a comparison of this with our analysis is as follows:

[1] *Conn. Agr. Expt. Sta., Bul.* 499: 4 (1946).

	As labelled	Our analysis
Moisture		7.42
Protein	20.	19.69
Fat	28.5	26.34
Fiber		0.90
Ash	4.5	4.60
Starch		20.65
Reducing sugars		0.94
Sucrose		2.74
Total available carbohydrate	39.	41.05
Salt	0.77	1.05
Calories per 100 grams	492	480

Because these cookies were sold as a special dietary food, the use of saccharin is permissible, but a preparation containing 3.68 per cent of sugars should not be labelled "sugar-free".

K.F.-1230. Custard Squares. Pure Food Market, Waterbury, Conn. Analysis showed these squares to contain no egg; they were not, therefore, "custard squares", since eggs are an essential ingredient of custard.

A.F.-1144. Golden Cocoanut Bars. Golden Cookie Company, Watertown, Mass. Declared ingredients were "flour, cocoanut, sugar, shortening, invert sugar, molasses, egg yolks, skim milk powder, pure butter flavor, leavening and salt". So far as we know, a "pure" butter flavor, which would mean a flavor made only from butter, is not on the market.

J.C.-39. Grissol Bread. Grissol Bread Specialties Ltd., Montreal, Canada. This sample was taken because the bakery was not licensed under the bakery law, and no question of adulteration or misbranding was involved. Analysis was as follows: Moisture, 3.28; ash, 2.68; protein, 14.22; fiber, 0.30; available carbohydrate, 79.10, and fat, 0.42 per cent.

Beverages, Carbonated, etc.

Ninety-four samples of carbonated beverages were examined for the Commissioner. No sample was found to contain saccharin or undeclared artificial color or to be deficient in sugar. Approximate sugar content (solids by refraction) in 57 samples ranged from 6.68 to 14.08 per cent, and averaged 10.86 per cent. However, of 13 samples of "Nutmeg Club" sodas, put up by the Nutmeg Club Beverage Co. of New London, eight contained dulcin (p-phenetylurea), an unpermissible artificial sweetener. Three samples of beverages bottled by the Nobby Bottling Co. of New Britain contained a quaternary ammonium compound, an unpermitted preservative, added in the form of a preparation sold as "Bevco Stabilizer".

Eleven official samples of uncarbonated beverages were also examined as follows:

E.C.-577. Arctic Brand Pineapple Punch. Pan-Tree Food Products Co., Rochester, N. Y. This was declared to contain "crushed pineapple and juice"; analysis showed 5.36 per cent of invert sugar and 0.069 per cent of ash, corresponding to 16 per cent pineapple juice.

K.C.-321. Grade A Quality Peach Nectar. Jamboree Fancy Foods, Brooklyn, N. Y. This preparation was labelled "Contains peaches, water, and dextrose". It contained no intact peaches, but was a suspension of peach pulp in

water. Total sugar content was 7.19 per cent; the ash of 0.13 per cent indicated about 27 per cent peaches. Sample was passed.

K.C.-460 and E.S.-1780. Princess West India Lime Fruit Juice Beverage. J. P. W. von Laer Co., Boston, Mass. Declared ingredients were "59.9% water, 40% lime juice". No sugar whatever could be detected in these samples, but some lime juice contains no sugar[1]; on the basis of an average ash content of 0.4 per cent for lime juice[1], the average of 0.129 per cent ash found in the two samples indicated that 32 per cent of lime juice was present.

E.S.-1154. Southern Brand Grape Drink. Army Packing Co., Utica, N. Y. Declared ingredients were "grape juice, genuine grape extract, refined syrup, water, color, citric acid, tartaric acid, 1/10 of 1% benzoate of soda". Analysis showed 7.66 per cent of invert sugar and 0.29 per cent ash; the product tasted like diluted prune juice, but was passed.

E.S.-1824 to 1826. Southern Pineapple Fruit Drink. Army Packing Co., Utica, N. Y. Declared ingredients were "pure pineapple juice, cane sugar, refined syrup, citric acid, water and certified color, 1/10 of 1% benzoate of soda". On the basis of an average ash of 0.4 per cent for pineapple juice[2], the average ash of 0.082 per cent found in these samples indicated 21 per cent of pineapple juice. The average sugar content was 5.46 per cent; E.S.-1824 contained only 4.77 per cent of total sugars and did not meet the 5 per cent minimum required by the beverage law.

K.C.-2. Strawberry Malted Milk. Threemore Sales Co., Brooklyn, N. Y. This product should have been labelled "Imitation Strawberry".

E.C.-628 and E.S.-1376. Vita Orange with Vitamins Added. California Fruit Juice Co., New London, Conn., and Paterson, N. J. These samples were claimed to contain orange juice fortified with orange juice concentrate and to have 2400 units of vitamin B_1 and 2200 units of vitamin C added to each half gallon. Actually, the total orange juice content was no more than 19 per cent. E.C.-628 contained 1154 units of vitamin C per half gallon; E.S.-1376 contained only 0.025 milligram per cubic centimeter, which is only 5 per cent of the amount of vitamin C in unfortified fresh orange juice.

Five samples of whiskey, etc., were examined for police and a private individual.

Cheese

Twenty-three official samples of cheese and cheese food were examined for the Commissioner, and two unofficial samples were analyzed for private firms. Ten of the official samples were adulterated or misbranded; the other 15 samples were passed.

Twenty-two samples were grated cheese; analyses of these are given in Table 1. The 3 ungrated products were the following:

9770. Creamed Cottage Cheese. Brock-Hall Dairy Co., Hamden, Conn. Analysis showed water, 77.62; casein, 11.68; fat, 5.99; lactose, 1.67; total carbohydrate, 3.65, and ash, 1.06 per cent. Total calories per 100 grams were 115.

K.C.-491. Fontelle Banquet Spread. Cumberland Dairy Products Co., Brooklyn, N. Y. This sample was submitted because of a dealer's complaint

1 Chatfield and McLaughlin, *U. S. Dept. Agr. Circ.* 50, (1928).
2 Chatfield and Adams, *U. S. Dept. Agr. Circ.* 549, (1940).

TABLE 1. GRATED CHEESE

No.	Manufacturer or distributor and brand	Water per cent	Lactose per cent	Dry skim milk per cent	Remarks
K.F.-1085	J. Colonna Bros., North Bergen, N. J. *Italian Kitchen*	14.97	0.25	0	Pass.
K.N.-924	J. Colonna Bros., North Bergen, N. J. *Italian Kitchen*	29.18	0.00	0	Pass.
E.C.-632	Connecticut Produce Distributors, Hartford, Conn. *Marconi*	22.70	0.00	0	Adulterated with starch.
J.W.-874	Connecticut Produce Distributors, Hartford, Conn. *Marconi*	.....	0.00	0	Adulterated with starch.
K.N.-923	J. & P. Glaviano Co., Inc., Jersey City, N. J. *Roman*	3.65	0.00	0	Slack-filled and short weight.
K.C.-486	Iceo Cheese Co., Inc., Brooklyn, N.Y. *Iceo*	4.67	0.00	0	Short weight.
K.F.-1324	La Prima Importing Co., Torrington, Conn. *La Prima*	.....	0.00	0	Short weight.
K.C.-496	Magic Chef Food Products Co. Div. of Kurtz Bros., Bridgeport, Pa. *Magic Chef*	3.67	12.95	19	Adulterated with dry skim milk, slack-filled and short weight.
K.F.-1315	Magic Chef Food Products Co. Div. of Kurtz Bros., Bridgeport, Pa. *Magic Chef*	7.68	19.40	34	Adulterated with dry skim milk and slack-filled.
K.F.-1316	Magic Chef Food Products Co. Div. of Kurtz Bros., Bridgeport, Pa. *Magic Chef*	7.02	19.77	35	Adulterated with dry skim milk.
K.F.-1317	Magic Chef Food Products Co. Div. of Kurtz Bros., Bridgeport, Pa. *Magic Chef*	8.26	21.22	39	Adulterated with dry skim milk, slack-filled and short weight.
K.F.-1318	Magic Chef Food Products Co. Div. of Kurtz Bros., Bridgeport, Pa. *Magic Chef*	7.18	17.73	30	Adulterated with dry skim milk, slack-filled and short weight.
K.F.-1062	Manufacturer unknown	.....	.....	....	Bulk cheese; decomposed. Casein, 30.11; fat, 39.60, and ash, 7.81 per cent.
9601	Pepe-Maisano Co., New Haven, Conn.	18.62	0.00	0	Sample is a whole milk cheese; pass.
E.C.-521	Quality Grated Cheese Co., Roxbury, Mass. *Quality*	13.24	16.44	30	Adulterated with dry skim milk, slack-filled and short weight.
E.C.-591	Quality Grated Cheese Co., Roxbury, Mass. *Quality*	14.89	9.72	14	Adulterated with dry skim milk.
E.S.-1353	Rialto Food Products, Philadelphia, Pa. *Rialto*	26.80	0.00	0	Pass.
K.F.-1143	H. Santomauro, Brooklyn, N. Y. *Pecorella*	27.17	0.00	0	Pass.
K.N.-1023	H. Santomauro, Brooklyn, N. Y. *Pecorella*	24.90	0.00	0	Pass.
E.S.-1324	H. Santomauro, Brooklyn, N. Y. *Pecorella*	25.35	0.00	0	Pass.
E.C.-650	Serto Packing Co., New York, N. Y. *Nemi*	.....	0.00	0	Short weight.
K.F.-1057	Uddo & Taormina Co., Brooklyn, N. Y. *Progresso*	2.79	0.00	0	Slack-filled and short weight.

that it was full of hard particles that might be glass. The hard particles were lactose (milk sugar) crystals, and were harmless.

K.F.-1296. Provolino Cheese. Analysis was as follows: Water, 48.00; casein, 26.93; fat, 14.56; lactose, 0.00, and ash, 4.34 per cent.

Chop Suey and Chow Mein

Twelve samples of these Chinese foods were submitted by the Commissioner. Ten were "Chun King" brand, products of the Bean Sprout Growers' Association, Duluth, Minn. Four, labelled as "bean sprouts" or "chop suey vegetables", were passed and 6 were misbranded:

A.F.-1052 and K.F.-1321 and 1322. Chun King Chop Suey Beef Style. Declared ingredients were "celery, bean sprouts, mushrooms, onions, pimientos, vegetable protein derivatives (artificial seasoning), vegetable oil, parts of corn and wheat, with salt, natural herbs, and spices added". Little, if any, onion and no beef were present; the can was inconspicuously labelled "This product contains no meat", but this did not obviate the deception of the "Beef Style".

A.F.-1053 and K.F.-1319 and 1320. Chun King Chow Mein Chicken Style. The ingredient declaration and the claim for "no meat" were the same as for the "beef" product; this product was just as deceptively labelled.

Two other brands of "Chicken Chop Suey" were passed because they contained some chicken, although not a great deal.

Confectionery

Thirty-nine samples of confectionery were examined for the Commissioner, and one sample was examined at the request of the New Haven Health Department.

Twenty-three samples of candy were submitted only because of possible technical labeling violations; 21 of these were misbranded and two were passed.

Eight chewing gum novelties in the form of whistles or harmonicas contained substantial amounts of paraffin. In no case was paraffin declared on the label; such names as "gum base" and "plastic chewing gum base" were used where there was any ingredient declaration. One manufacturer claimed that this nomenclature was required by rulings of the U. S. Food and Drug Administration, but correspondence with the Administration disproved this claim. One product, "Toy Fire Chief Whistle", contained no ingredient statement at all. It was found displayed at a counter with candies; the dealer first stated to the inspector that these whistles were being sold for gum, but claimed that they were only toys when the inspector identified himself. This appears to be a transparent attempt to evade the Food, Drug and Cosmetic Act.

Results of analysis of these novelties were as follows:

K.C.-619. Chewing Gum Novelties. Tecco Products Co., Berkeley, Cal. Paraffin 98.35 per cent; balance water, perfume and artificial color.

K.C.-621 and K.F.-1411. Super Police Whistles. Star Molding Corp., East Aurora, N. Y. Average paraffin content 90.90 per cent; trace of sugar and artificial color.

A.F.-1129. Touch Here Warble! Star Molding Corp., East Aurora, N. Y. Paraffin 90.0 per cent; trace of sugar and artificial color.

K.C.-622. Toy Fire Chief Whistle. Toy Division, Glenn Co., Inc., Buffalo, N. Y. Paraffin 83.0 per cent; balance calcium carbonate and coal tar dye.

K.F.-1406 and 1442 and E.S.-1818. Wowee. Average paraffin content 60.70 per cent; balance calcium carbonate and sugar, artificially flavored and colored.

Eight miscellaneous samples were examined as follows:

K.C.-629 Co-Co-Mins. Vital Foods Corporation, Evanston, Ill. These candies were labelled to contain "saccharine, a non-nutritive"; saccharin was found to be present. Because they were not sold as a special dietary food for low calorie diets, they were adulterated even though saccharin was declared.

E.C.-625. Honey Cluster Pops. Honey Bee Sweets, Brooklyn, N. Y. No honey was declared in the list of ingredients, which were "sugar, corn syrup, citric acid and artificial flavors, U. S. cert. colors". The name "Honey Cluster Pops" infers, if it does not actually state, that these lollipops contain honey. The product had no flavor of honey.

E.C.-635. Lincoln Chocolate Fudge, the Magic Mix. Lincoln Fruit & Syrup Co., Lawrence, Mass. Webster's dictionary defines "fudge" as "a kind of soft candy composed of sugar, milk, butter and chocolate or maple sugar, and often containing nuts, boiled and stirred to a proper consistency". This sample was a thick liquid that was not fudge but a mix from which fudge could be made by adding sugar and milk, boiling, cooling and beating. Because the words "Chocolate Fudge" on the label were very prominent, while "The Magic Mix" was inconspicuous, the sample was misleadingly labelled and consequently misbranded.

K.C.-630. Myrelle Marshmallows. Myrelle Cookies, Bronx, N. Y. Artificial color was present and not declared.

9671. Torch Marshmallow Cones. B. & S. Sales, Chelsea, Mass. This sample consisted of pastry cones, such as are used for ice cream cones, with pieces of marshmallow stuck in the top instead of ice cream. Declared ingredients were "corn syrup, sugar, inverted sugar, gelatin, flour, starch, salt, artificial flavor and color". The sample was submitted primarily for examination for the presence of mineral oil. No mineral oil was found; the topping was a mixture of cane sugar, invert sugar and gelatine. Analysis showed water, 8.32; ash, 0.14; fat and fiber, none; gelatine, 9.88; sucrose, 48.26; invert sugar, 23.00, and undetermined carbohydrate by difference, 10.40 per cent.

K.F.-1186, 1187 and 1354. Whipped Cream Caramels. New Orleans Confections, Inc., Chicago, Ill. The label read "Rich! Creamy goodness made with pure whipping cream—Ingredients condensed milk, syrup, dextrose, chocolate, artificial flavor and certified food color". Average analysis was: Fat, 8.06 per cent; Reichert-Meissl value of fat, 3.8; estimated per cent butter fat in sample, 1.0. This product did not contain more than a trace at most of whipping cream.

Contaminated or Decomposed Foods

Two hundred and eighty-seven samples of miscellaneous foods were submitted by the Commissioner because of rodent or insect contamination or the presence of foreign matter, or because of complaints that the foods had made people ill. Rat feces, insects or both were found in 76 samples, including 24 samples of pastry mixes, 14 of corn meal, nine of candies, eight of popcorn, three of pretzels and bread sticks, three of almonds, two each of cereal, flour, fruit cake, raisins and spaghetti, and one each of dried prunes, beefsteak, figs, nut meats and rice. *J.W.-848, Puritan Baked Beans with Pork,* made by Maine Canned Foods, Inc., Portland, Maine, contained a bunch of rat hairs. A sample of baby food contained a piece of glass and another was decomposed; two cans of "Burns Sliced Beets" packed by Alton Canning Co., Inc., Alton, N. Y., were swelled; a loaf of bread had some grease on it; some chocolate bars had a foreign odor; two cans of "Desire Brand Cream Style Golden Sweet Corn", distributed by General Wholesale Grocery Co., Hartford, Conn., were stale; a carbonated beverage and some pickled cherry peppers were fermented, as were two samples of "Southern Pineapple Fruit Drink", manufactured by Food Division, Army Packing Co., Inc., Utica, N. Y.; another sample of peppers was moldy; a bottle of root beer contained part of a cigarette; some frozen string beans were sour; a sample of sugar syrup was contaminated with mineral oil, and *E.S.-10, McGraths Condensed Vegetable Soup,* packed by H. J. McGrath Co., Baltimore, Md., contained 250 parts per million of tin.

Because of a report from Federal authorities that a bulk shipment of soy sauce from Chicago had become accidentally contaminated with arsenic and had been generally distributed in the trade, 126 samples of soy sauce were submitted by the Food and Drug Commission for examination for the presence of arsenic. No gross amount of arsenic was found in any sample, but seven samples contained arsenic (as arsenic trioxide) in excess of 3.5 parts per million. These samples were the following:

J.C.-49. Chop Suey Sauce. Chinese Food Cannery of America, East Hartford, Conn. Arsenic trioxide, 5.8 parts per million.

E.C.-749 and K.F.-1328. Fuji Sauce. Fuji Trading Co., Chicago, Ill. Arsenic trioxide, 4.5 and 6.5 parts per million.

J.W.-898. Derby Glaser Brand Chop Suey Sauce. Glaser, Crandell Co., Chicago, Ill. Arsenic trioxide, 6.8 parts per million.

E.C.-758. Shing-Li Chinese Sauce. H. & G. Packing Co., New London, Conn. Arsenic trioxide, 3.9 parts per million.

J.C.-34. Soy Sauce (bulk sample). Far East Restaurant, Meriden, Conn. Arsenic trioxide, 5.2 parts per million.

K.C.-538. Worthington Soy Sauce. Special Foods, Worthington, Ohio. Arsenic trioxide, 3.9 parts per million.

Of the total of 270 official samples, 89 were considered adulterated and 181 were passed.

Thirty-seven samples were examined for State and city health departments and private individuals. A loaf of sliced bread was moldy; some chopped meat was decomposed; a sample of "Teen-A-Mint" gum, made by Pharmaco, Inc., Newark, N. J., contained two pieces of glass; three cans of fresh lobster meat, packed by E. P. Melanson of St. Thomas, New Bruns-

wick, were decomposed; a bottle of milk contained an insoluble residue of calcium phosphate and hypochlorite; a bottle of orange soda contained two cockroach nymphs; some potatoes were probably contaminated with benzene hexachloride; and some "worms", claimed to have been found on a steak, were identified as fly maggots. In all, 10 samples were considered adulterated and 27 were passed.

Deceptive Packaging

Of two different brands of the same food selling for the same price, the average purchaser will choose the one in the larger package, even though the actual weight of food may be the same in both packages. Manufacturers recognize this fact, and some of them have taken advantage of it by packing their products in containers whose capacity considerably exceeds the volume of the contents. Such a practice is misleading, and the law so considers it.

One hundred and fifteen samples were submitted by the Commissioner because of suspicion that they were deceptively packed. One hundred and two of these were in packages containing so much waste space as to be definitely misleading and 13 were passed. Deceptively packed samples included 43 candies, mostly candy bars; 33 gelatine dessert mixes; nine pudding mixes; two samples each of vanilla extract, dehydrated peppers, macaroni and pickled cabbage; and one sample each of celery flakes, crackers, dehydrated mint, dehydrated onions, pepper flakes, pie crust mix, potato chips, pumpkin pie filling and tea.

Seventeen of the gelatine dessert mix samples were "Willbak Gelatine Dessert", made by Willbak Corporation of Brooklyn, N. Y., and 10 were "Tip Top True Fruit Gelatin Dessert", made by Tip Top Food Corp., New York, N. Y.

The two pickled cabbage samples, *K.F.-1147 and 1148*, were "Mother May's Pickled Cabbage", manufactured by Mrs. Warner's Preserving Co., Elizabeth, N. J. This cabbage was packed in glass, and as the contents were visible it might be thought that no deception would be possible. However, cabbage packed in a liquid will spread out so as to appear to fill the whole container even when only a small amount of solid material is present. In good manufacturing practice a quart of packed sauerkraut contains at least 25 ounces of drained solids[1]; of these two samples, one was a pint and contained only 8.61 ounces of drained solids, and the other was a quart containing 18.20 ounces of drained solids.

In one unofficial sample of an extract bottle and carton, *9970*, the carton was only half filled.

Extracts and Flavors

Seven extracts and flavors were examined for the Commissioner. Three were vanilla or imitation vanilla extracts or flavors:

K.C.-602. Big C Imitation Vanilla Flavoring. Clyde Collins, Inc., Memphis, Tenn. Declared ingredients were "coumarin, vanillin, caramel color, and water". This sample contained about 5 per cent of propylene glycol which was not declared on the label.

G.S.-604. Lausier Imitation Vanilla Flavor. A. J. Lausier Co., Southington, Conn. Declared ingredients were "vanillin, ethyl vanillin, coumarin, caramel color, alcohol, sugar and water.—Alcohol 1.3%". Analysis showed vanillin and ethyl vanillin, 0.35, and coumarin, 0.13, gram per 100 cc. Sample was passed.

[1] Federal Notice of Judgment, Food, Drug and Cosmetic Act, 9574, (June 1947).

K.C.-473. Park City Brand Pure Extract Vanilla. Reliable Coffee Co., Inc., Bridgeport, Conn. This sample was submitted because the extract was not clear, but this is not unusual for vanilla extract. Analysis was as follows: Vanillin, 0.24, and coumarin, 0.16, gram per 100 cc; lead number, 0.65. Sample was passed.

The other four samples were the following:

E.S.-1673. Cultivated Extrin—AA. Extrin Foods, Inc., New York, N. Y. This preparation, which was claimed to be a mixture of bacterial cultures with "cream, sweet cream buttermilk, salt, vegetable oils, egg yolk, lecithin, natural color", was sold for a "natural replacement for butter and common butter flavors in baking". Analysis was as follows: Water, 23.98; protein, 9.12; fat, 42.01; ash, 6.17; lactose, 11.52; total carbohydrate, 18.72, and lipoid phosphoric acid, 0.016 per cent. No coal tar dye was detected. The lipoid phosphorus indicated not more than 0.58 per cent of egg yolk plus lecithin, and from the Reichert-Meissl value of the fat (4.9) there was probably no more than 7 per cent of butter fat. The sample was passed.

A.F.-1094. Efco Brand Strawberry Flavor. Effron Baking Supply Co., Poughkeepsie, N. Y. This preparation bore no ingredient declaration; it contained both artificial flavor and color, neither of which was declared. It was an imitation strawberry flavor and should have been so labelled.

K.F.-1296. Kola Acid. Concordade Co., Inc., Providence, R. I. This preparation was an 81.58 gm./100 cc. solution of phosphoric acid. The phosphoric acid should have been declared on the label.

E.C.-703. Vitaplex. Vitaplex Co., Chicago, Ill. This product was labelled "Propylene glycol-dulcin (phenetylurea) chemically pure without food value —for manufacturing use only". Analysis showed dulcin and 95 per cent of propylene glycol to be present.

There is no question but what this preparation was being sold to carbonated beverage bottlers with the intent that they should illegally use it in place of sugar as a sweetener. The present sample was obtained at the plant of the Nutmeg Club Beverage Co. of New London, and was the source of the dulcin found in the beverages manufactured by that company that are reported on page 6. The manufacturer of "Vitaplex" is morally responsible for these violations of the law, and may be legally responsible also in spite of the evasive labeling of the product, but he is not within the jurisdiction of the Connecticut courts.

Of the total of 7 samples, 4 were adulterated or misbranded and 3 were passed.

Fats and Oils

Butter

Four samples of butter submitted by the Commissioner were all genuine butter, but one, *J.W.-912, Silverbrook Creamery Butter*, packed by the Great Atlantic & Pacific Tea Co., New York, N. Y., was slightly rancid. One sample of oleomargarine was passed.

Other Oils and Fats

One hundred and twelve official and nine unofficial samples of oils and fats were examined. Seventy were sold as mixtures of oils or as "imitation olive oil", "edible oil", etc. The balance were claimed to be individual varieties of oils or fats, as follows: olive oil, 34; linseed oil, 4; peanut oil, 4; corn oil, 3; cottonseed oil, 3; mineral oil, 2; beef fat, 1, and cocoanut oil, 1.

Of the 34 samples sold for pure olive oil, nine were adulterated with other oils and in some cases were also artificially flavored or colored or both. The brand names of only the following three of these adulterated oils were known to us:

K.N.-1022. La Vergine Alata Olio Puro Di Oliva. Contained cottonseed oil and 21.90 per cent mineral oil. There was no packer's name or address.

K.F.-1151. Mamma Mia 100% Pure Olive Oil. Mamma Mia Importing Co., Inc., Brooklyn, N. Y. Contained a trace of cottonseed oil and about 20 per cent peanut oil. Short volume 3.4 fl. oz.

K.F.-1184. Roberta Pure Olive Oil. Sample was artificially colored corn or soy oil; the can bore no packer's name.

Of the other 17 samples sold as unblended oils, one sample of cottonseed oil and two each of linseed and peanut oils were adulterated:

K.N.-1154. Gallo's Pure Salad Oil. I. A. Gallo, Hartford, Conn. This sample was labelled "made from choice cottonseed oil", but actually all except a trace of it was peanut oil; the can was also five ounces short of the declared volume of one gallon.

E.S.-1565. Figlia d'Italia Brand Pure High Grade Peanut Oil. Universal Salad Oil Co., Brooklyn, N. Y. Sample was a mixture of peanut and cottonseed oils; the can was 1.1 ounce short volume.

8848. Linseed Oil. Sample was adulterated with 4 per cent of mineral oil and probably also with another vegetable oil (the iodine number was only 98, as against a minimum value of 160 for linseed oil).

460. Raw Linseed Oil. Sample was at least 80 per cent mineral oil.

E.S.-1696. Monaco Brand Pure Peanut Oil. Monaco Oil Packing Co., Brooklyn, N. Y. Sample was adulterated with cottonseed oil and was 3.4 ounces short volume.

Of the 67 blended oils, 47 were adulterated or misbranded and 20 were passed. Adulterated and misbranded samples are listed in Table 2, but two samples call for particular attention:

E.S.-1575 and 1638. Fortuna Mia Salad Oil. Fortuna Mia Oil Corp., Brooklyn, N. Y. These samples were labelled as containing 65 per cent peanut oil, 30 per cent corn oil and 5 per cent olive oil. They were in 3 ounce bottles. Qualitative tests showed a trace of cottonseed oil and no peanut, sesame, teaseed or mineral oils; artificial color was present but no artificial flavor was detected. Constants of the oils were as follows:

	E.S.-1575	*E.S.-1638*
Butyro refraction, 25° C.	64.0	64.3
Iodine no.	101	101
Saponification no.	205	203
Reichert-Meissl value	3.4	3.5
Polenske value	3.1	3.8
Squalene value	19	19

TABLE 2. ADULTERATED AND MISBRANDED SALAD OILS

No.	Dealer and brand	Remarks
	Ansonia	
K.F.-1194	Carl's Market. *Alena Brand Fine Oil*	No peanut oil as claimed; short volume 4.5 fl. oz.
K.F.-1152	Romanos Market. *Santuzza Brand Oil*	No peanut oil as claimed; short volume 2.8 fl. oz.
	Bridgeport	
K.C.-4	Venice Importing Co. *Mother's Brand Best Blended Edible Oil*	No name of packer.
	Danbury	
K.F.-1213	Salerno Importing Co. *Valencia Brand, the Perfect Salad Oil*	Short volume 1.8 fl. oz.
	Greenwich	
K.C.-623	Maplecrest Market. *Lucca Brand Pure Edible Oil*	Artificial flavor present not declared; short volume 1.8 fl. oz.
	Hartford	
E.S.-1629	C. Calvo & Sons. *Fortuna Mia Salad Oil*	Coal tar dye present not declared.
E.S.-1630	C. Calvo & Sons. *Fortuna Mia Salad Oil*	Coal tar dye present not declared.
E.S.-1631	C. Calvo & Sons. *Fortuna Mia Salad Oil*	Coal tar dye present not declared.
E.S.-1632	C. Calvo & Sons. *Fortuna Mia Salad Oil*	Coal tar dye present not declared.
E.S.-1633	C. Calvo & Sons. *Fortuna Mia Salad Oil*	Coal tar dye present not declared.
E.S.-1634	C. Calvo & Sons. *Fortuna Mia Salad Oil*	Coal tar dye present not declared.
E.S.-1635	C. Calvo & Sons. *Fortuna Mia Salad Oil*	Coal tar dye present not declared.
E.S.-1636	C. Calvo & Sons. *Fortuna Mia Salad Oil*	Coal tar dye present not declared.
E.S.-1637	C. Calvo & Sons. *Fortuna Mia Salad Oil*	Coal tar dye present not declared.
J.W.-831	C. Calvo & Sons. *Fortuna Mia Salad Oil*	Artificial flavor and color present not declared; peanut oil 61.20 per cent as against 65 per cent declared.
J.W.-835	C. Calvo & Sons. *Fortuna Mia Salad Oil*	Coal tar dye present not declared.
J.W.-854	Connecticut Produce Distributors. *Fortuna Mia Salad Oil*	Peanut oil: declared, 65 per cent; found, 34 per cent.
J.W.-855	Connecticut Produce Distributors. *Fortuna Mia Salad Oil*	Artificial flavor and color present not declared. Peanut oil: declared, 65 per cent; found, 81.80 per cent.
J.W.-827	International Market. *Alena Brand Fine Oil*	Peanut and corn oils and 10 per cent olive oil declared; no peanut oil present; short volume 3.7 fl. oz.

TABLE 2. ADULTERATED AND MISBRANDED SALAD OILS (Continued)

No.	Dealer and brand	Remarks
J.W.-812	Latina Food Store. *Santuzza Brand Oil*	Corn, peanut, cottonseed and olive oils declared; no peanut oil present.
J.W.-814	Latina Food Store. *Santuzza Brand Oil*	Corn, peanut, cottonseed and olive oils declared; no peanut oil present; short volume 3.8 fl. oz.
J.W.-828	Universal Products Trading Co. *Gustoso Brand Oil*	Labelled "Corn and 100% Pure Olive Oil", an obvious impossibility; cottonseed oil present; about 12 per cent olive oil.
	Middletown	
K.N.-1024	C. Marino & Son. *Santuzza Blended Oil*	Short volume 2.9 fl. oz.
	New Britain	
G.S.-649	Garcia Importing Market. *Gustoso Brand Oil*	Labelled "Corn and 100% Olive Oil"; cottonseed oil and artificial color present not declared; about 5 per cent olive oil.
K.N.-1103	Sorento Importing Co. *Bellezza Brand Fine Blended Oil*	Cottonseed oil present not declared; short volume 2.4 fl. oz.
J.C.-12	Vittoria Importing Co. *Lucca Brand Superfine Oil*	Olive oil declared but no more than 3 per cent, if any, present; short volume 13.5 fl. oz.
	New Haven	
E.S.-1459	Amore's Sanitary Market. *Santuzza Brand Oil*	Peanut oil declared but none present; short volume 2.9 fl. oz.
E.S.-1773	Bob's Market. *Morea Brand Blended Oil*	Short volume 2.7 fl. oz.
E.S.-16	Cooperative Grocery. *Mother's Brand Super Edible Oil*	No name of packer.
E.S.-1536	Corolla's Fine Food Store. *Marca Re Extra Fine Oil*	Short volume 2.6 fl. oz.
E.S.-1476	Crestena Importing Co. *Santuzza Brand Oil*	Short volume 3.7 fl. oz.
E.S.-1493	Louis Gallina. *Edible Oil*	74 per cent mineral oil, artificially colored.
E.S.-1494	Louis Gallina. *Edible Oil*	74 per cent mineral oil, artificially colored.
E.S.-1575	Mohican Co. *Fortuna Mia Salad Oil*	See page 14.
E.S.-1638	Mohican Co. *Fortuna Mia Salad Oil*	See page 14.
9214	New Haven Health Dept. *Figlia d'Italia Brand Oil*	Labelled "a pure high grade peanut oil"; cottonseed oil present not declared.
E.S.-1529	New Haven Police Dept. *Santuzza Brand Oil*	Short volume 2.0 fl. oz.
E.S.-1530	New Haven Police Dept. *Santuzza Brand Oil*	Peanut oil declared and not present; short volume 2.1 fl. oz.
	New London	
E.C.-12	Longo's Market. *Prosperity Brand Oil*	Short volume 3.5 fl. oz.
E.C.-795	National Wholesale Grocers, Inc. *Palermo Brand Oil*	Imitation olive oil and not so labelled.

TABLE 2. ADULTERATED AND MISBRANDED SALAD OILS (Concluded)

	Norwich	
E.C.-22	De Pinto's Grocery. *Carabinieri Brand Imitation Olive Oil*	Misleadingly labelled because of the relative prominence of the "Olive Oil".
	Stamford	
K.C.-516	National Merchandising Service Corp. *Konut Oil*	Oil was cocoanut oil; identity not declared on label.
	Stratford	
E.S.-1695	Andy & Mickey's Market. *California Brand Oil*	Coal tar dye present not declared; no name of packer; short volume 9.3 fl. oz.
	Torrington	
A.F.-47	Leo's Open Air Market. *La Vergine Brand Corn and Pure Olive Oil*	No olive oil present; short volume 5.2 fl. oz.
A.F.-48	Taty's Market. *La Vergine Brand Oil*	No olive oil present; short volume 5.6 fl. oz.
	Waterbury	
K.F.-13	Capitol Importing Co. *Figlia Mia Oil*	Olive oil declared but little if any olive oil present.
K.F.-38	International Importing Co. *Lucky Star Brand Oil*	Corn and olive oils declared; little if any olive oil present; short volume 1.4 fl. oz.
K.F.-39	International Importing Co. *La Vergine Brand Oil*	Corn and olive oils declared but little if any olive oil present; picture of olive tree misleading; short volume 2.2 fl. oz.
K.F.-1155	Massimo Market. *Santuzza Brand Oil*	Short volume 3.5 fl. oz.
A.F.-1121	Di Martino Market. *Prosperity Brand Extra Fine Quality Oil*	Short volume 3.2 fl. oz.

This combination of values would not be given by any of the common vegetable oils or a mixture of them. The low refraction would indicate olive, peanut or teaseed oil, but tests showed that no more than a trace at most of any of these oils was present. The saponification number and the Reichert-Meissl and Polenske values are all too high for any common vegetable oil. It was suspected that the samples were mixtures of cocoanut oil and either corn or soy oil. A mixture of 17 per cent cocoanut oil and 83 per cent corn oil, *9634*, was prepared and analyzed. Constants of this mixture were: refraction, 66.1 at 25° C; saponification no., 204; iodine no., 104; Reichert-Meissl value, 2.6, and Polenske value, 2.4. This confirmatory evidence that *E.S.-1575 and 1638* were composed of a mixture of cocoanut and corn or soy oils became practically conclusive when it was found that both samples and the known mixture gave identical tests for cocoanut oil by the A.O.A.C. test (**19.32**) for cocoanut oil in cocoa butter.

Fish

Four samples each of salmon and tuna fish, one sample of codfish and one of sardines, were examined for the Commissioner.

K.F.-1118 and 1119, "Fancy Spring Chinook Salmon", packed for John Hayman of Detroit, Mich., were submitted to Glenn G. Slocum, acting chief of the division of microbiology of the U. S. Food and Drug Administration, to see if they were spring Chinook salmon as labelled. He replied that "The soft texture, color of the flesh and oil, size of the flakes and the vertebrae, together with the odor and general appearance indicate that the product complies in these respects with the description of spring chinook salmon".

K.C.-492 and 493, "Storm King Brand Chinook Salmon", Rolph, Mills & Co., selling agents, bore labels that had been partially defaced and that did not give the address of the selling agents, but the contents appeared to be as claimed.

Two of the tuna fish samples were examined only because of technical labeling questions and were passed. The other two were both "Topa Brand Tunny Fish in Pure Olive Oil", packed by J. Florentino Topa, Olhão, Portugal. One, *K.F.-1288*, was submitted to Dr. Slocum for identification and was reported by him to be tuna fish of good quality. The oil from the other, *K.F.-1289*, was analyzed as follows: Butyro refraction, 25° C., 61.6; iodine no., 82; squalene value, 494; ether-insoluble bromides, 1.17 per cent; estimated per cent fish oil, 7, calculated iodine no., 87. These constants confirm the claimed presence of olive oil.

The codfish, *K.N.-4*, was decomposed. The sardines, *E.C.-409, Norwegian Brisling Sardines in Sild Sardine Oil*, packed by Hermetik Fabriken "Norrig", Stavanger, Norway, were passed. Because the packing oil was claimed to be sardine oil, a comparison of its analysis with the authentic herring oil reported by us in 1945[1] is of interest:

	E.C.-409	*Herring oil*
Butyro refraction, 25° C.	77.8	74.2
Iodine no.	114	141
Squalene, mgm./100 gm.	53	40
Ether-insoluble bromides, per cent	8.60	46.25

We understand that during the war the Norwegians worked out a polymerization process for treating fish oil to remove its fishy odor and flavor,

[1] *Conn. Agr. Expt. Sta., Bul.* 499, 21-22 (1946).

and that this treated oil was used as a substitute for the unobtainable olive oil in packing sardines. The processing of the fish oil probably explains the low iodine number and bromide value of the oil from *E.C.-409*.

Fruit, Canned

Fifty-three samples of canned fruit were examined for the Commissioner; 24 were passed and 29 were found adulterated or misbranded. Analyses are given in Table 3.

Fruit Juices

Eleven official samples of fruit juice and one unofficial sample were examined. Four were tomato juice, four, cider or apple juice, three, grape juice, and one, cherry juice.

Three of the tomato juices were examined only as to appearance and flavor and were passed. The other, *K.F.-1441, Campbell's Tomato Juice*, made by Campbell Soup Co., Camden, N. J., was analyzed as follows: Total solids, 6.30; ash, 1.01; salt, 0.63, and salt-free solids, 5.67 per cent. In 1932[1], analyses of 10 market brands of tomato juice showed 5.42-8.34 per cent total solids, 0.29-0.87 per cent salt and 4.79-7.47 per cent salt-free solids. This sample fell within these limits and was passed.

Two official samples were sold as "apple juice" and one as "sweet cider", as follows:

K.C.-466. Cheek Brand Apple Juice, Vitamin C Added. Berks-Lehigh Cooperative Fruit Growers, Inc., Fleetwood, Pa. Each 10 ounce serving was declared to contain 30 milligrams of vitamin C; we found 39 mgm. in 10 ounces.

K.C.-478. Perfection Apple Juice. Perfection Canning Co., Inc., Newark, N. J. This was claimed to be "clarified", but considerable sediment of apple pulp and yeast cells was present.

K.F.-14. Pure Unfermented Sweet Cider. J. A. Thompson & Sons, Melrose, Conn. The following analysis did not indicate the addition of water: Specific gravity, 20° C., 1.0444; total sugars, 9.48, and ash, 0.212, gm./100 cc.; potassium carbonate in ash, 78.8 per cent.

An unofficial sample of sweet cider, *1040*, was submitted by the presser because it turned moldy. Only 0.04 per cent of sodium benzoate was present, which may have explained the poor keeping quality.

The three grape juices were the following:

E.C.-727. Bedford Pure Grape Juice, Sugar Added. Bedford Products, Inc., Dunkirk, N. Y.

E.S.-1654 and 1810. Grape Valley Pasteurized Grape Juice, Sugar Added. Grape Valley Juice Co., Utica, N. Y.

[1] *Conn. Agr. Expt. Sta., Bul.* 354, 793 (1933).

TABLE 3. CANNED FRUITS

No.	Manufacturer or distributor and brand	Drained solids per cent	Brix gravity of syrup	Sugars, per cent			Remarks
				Sucrose	Invert sugar	Total sugars	
K.F.-1423	G. M. Allen & Son, North Sedgwick, Me. *Allen's Maine Blueberries*	45.1	.....	.....	.....	.....	Low in drained solids; short weight (5 lb. 15 oz. as against 6 lb. 6 oz. decl.)
E.S.-1502	Apple Growers Assoc., Hood River, Ore. *Silver Grille Brand Bartlett Pear Halves*	.....	15.0	6.43	5.79	12.22	Pass.
E.S.-1705	Associated Frozen Food Packers, Inc., Seattle, Wash. *Magic Foods Brand Apple Sauce*	.....	.....	15.68	1.30	16.98	Pass.
E.S.-1545	H. G. Bauer & Co., Seattle, Wash. *Sun-Pak Brand Dark Sweet Cherries*	.....	25.1	7.55	12.16	19.71	Pass.
E.S.-1547	California Packing Corp., San Francisco, Cal. *Del Monte Brand Fruits for Salad*	.....	20.0	9.24	7.95	17.19	Pass.
E.S.-1559	California Packing Corp., San Francisco, Cal. *Del Monte Yellow Cling Peach Halves*	.....	18.6	11.10	5.70	16.80	Not heavy syrup as claimed.
E.S.-1503	Capolino Packing Co., Atwater, Cal. *Lazy Daisy Alberta Peach Halves*	.....	20.9	12.04	5.98	18.02	Pass.
K.F.-1424	Chandler River Co-Operative Canning Association, Jonesboro, Me. *Chandler River Maine Blueberries*	45.7	.....	.....	.....	.....	Low in drained solids.
K.N.-961	de Redon Food Products Co., New London, Conn. *Goltbo Maraschino Cherries*	.....	.....	.....	.....	.....	No sulphur dioxide; pass.
E.S.-1507	Elm Farm Foods Co., Boston, Mass. *Elm Farm Fruit Cocktail*	.....	19.0	8.04	8.65	16.69	Pass.
J.W.-909	First National Stores, Inc., Somerville, Mass. *Finast Cherries*	.....	21.7	7.03	10.62	17.65	Pass.
E.S.-1551	First National Stores, Inc., Somerville, Mass. *Finast Bartlett Pear Halves*	.....	17.3	9.61	5.42	15.03	Not heavy syrup as claimed.
E.S.-1555	First National Stores, Inc., Somerville, Mass. *"Yor" Garden Pear Halves*	.....	17.4	10.38	5.48	15.86	Not heavy syrup as claimed.
E.S.-1504	Flotill Products, Inc., Stockton & Modesto, Cal. *Flotill Peaches and Pears*	.....	17.4	8.10	6.65	14.75	Not heavy syrup as claimed.
K.F.-1	H. L. Forhan Co., Portland, Me. *Raymond Brand Maine Blueberries*	50.0	.....	.....	.....	.....	Pass.
K.F.-2	H. L. Forhan Co., Portland, Me. *Raymond Brand Maine Blueberries*	50.3	.....	.....	.....	.....	Pass.

TABLE 3. CANNED FRUITS (Continued)

K.F.-3	H. L. Forhan Co., Portland, Me. *Raymond Brand Maine Blueberries*	45.3	19.2	3.95	12.90	16.85	Low in drained solids.
K.F.-4	H. L. Forhan Co., Portland, Me. *Raymond Brand Maine Blueberries*	45.4	19.2	4.60	12.90	17.50	Low in drained solids.
K.F.-5	H. L. Forhan Co., Portland, Me. *Raymond Brand Maine Blueberries*	45.9	19.0	4.24	12.90	17.14	Low in drained solids.
K.F.-6	H. L. Forhan Co., Portland, Me. *Raymond Brand Maine Blueberries*	48.8	17.8	3.88	12.32	16.20	Low in drained solids; not heavy syrup as claimed.
K.F.-7	H. L. Forhan Co., Portland, Me. *Raymond Brand Maine Blueberries*	44.5	.....	.....	.....	.....	Low in drained solids.
K.F.-8	H. L. Forhan Co., Portland, Me. *Raymond Brand Maine Blueberries*	43.6	18.1	2.98	13.46	16.44	Low in drained solids.
K.F.-9	H. L. Forhan Co., Portland, Me. *Raymond Brand Maine Blueberries*	44.5	18.2	3.06	13.76	16.82	Low in drained solids.
K.F.-10	H. L. Forhan Co., Portland, Me. *Raymond Brand Maine Blueberries*	44.0	19.4	4.16	13.46	17.62	Low in drained solids.
K.F.-11	H. L. Forhan Co., Portland, Me. *Raymond Brand Maine Blueberries*	47.2	18.0	4.33	12.70	17.03	Low in drained solids.
K.F.-12	H. L. Forhan Co., Portland, Me. *Raymond Brand Maine Blueberries*	48.0	17.2	3.14	12.62	15.76	Low in drained solids; not heavy syrup as claimed.
K.F.-1171	H. L. Forhan Co., Portland, Me. *Raymond Brand Maine Blueberries*	43.2	.....	.....	.....	.....	Low in drained solids.
K.F.-1439	H. L. Forhan Co., Portland, Me. *Raymond Brand Maine Blueberries*	50.0	.....	.....	.....	.....	Pass.
K.F.-1440	H. L. Forhan Co., Portland, Me. *Raymond Brand Maine Blueberries*	46.6	.....	5.60	12.32	17.92	Low in drained solids.
E.S.-1505	Foster & Wood Canning Co., Lodi, Cal. *Gingham Girl Whole Unpeeled Apricots*	.....	19.4	8.37	7.63	16.00	Not heavy syrup as claimed.
K.N.-1028	Fruit Products Co. Div. of Natural Sugars, Inc., New York, N. Y. *Astoria Brand Cherries*	.....	.....	.....	.....	.....	No sulphur dioxide; pass.
K.F.-1158	Frye Realty Co., Harrington, Me. *Pigeon Brand Blueberries*	44.8	.....	.....	.....	.....	Low in drained solids.
K.F.-1165	Frye Realty Co., Harrington, Me. *Pigeon Brand Blueberries*	41.6	.....	.....	.....	.....	Low in drained solids.
K.F.-1166	Frye Realty Co., Harrington, Me. *Pigeon Brand Blueberries*	34.7	.....	.....	.....	.....	Low in drained solids.
K.F.-1090	Frye Realty Co., Harrington, Me. *Pilgrim Brand Blueberries*	39.3	.....	.....	.....	.....	Low in drained solids.
K.F.-1437	Gervas Canning Co., Inc., Fredonia, N. Y. *Gervas Black Raspberries*	53.8	16.0	1.16	12.24	13.40	Pass.
E.S.-1546	Great Atlantic & Pacific Tea Co., New York, N. Y. *Iona Unpeeled Apricot Halves*	.....	17.8	8.98	5.99	14.97	Pass.
E.S.-1550	Hunt Foods, Inc., San Francisco, Cal. *Hunt's Prune Plums*	.....	20.9	7.36	9.26	16.62	Pass.
E.S.-1549	Libby, McNeill & Libby, San Francisco, Cal. *Libby's Fruit Cocktail*	.....	20.0	4.76	12.51	17.27	Pass.
E.S.-1548	Libby, McNeill & Libby, San Francisco, Cal. *Libby's Sweet Royal Ann Cherries*	.....	20.7	5.23	11.12	16.35	Pass.

TABLE 3. CANNED FRUITS (Concluded)

No.	Manufacturer or distributor and brand	Drained solids per cent	Brix gravity of syrup	Sugars, per cent			Remarks
				Sucrose	Invert sugar	Total sugars	
E.S.-1506	Manteca Canning Co., Manteca, Cal. *Puretest Brand Yellow Cling Peach Halves*	.....	17.8	12.04	3.80	15.84	Not heavy syrup as claimed.
K.F.-1425	Monmouth Canning Co., Portland, Me. *Monmouth Brand Maine Blueberries*	41.4	12.3	2.26	8.48	10.74	Low in drained solids; not light syrup as claimed.
E.S.-1553	Mor-Pak Preserving Corp., Stockton, Cal. *Aunt Mary's Fancy Kadota Figs*	.....	23.6	5.09	18.00	23.09	Pass.
K.F.-1364	Papas Bros. & Gillies, Egg Harbor, N. J. *Jersey Pack Brand Blueberries*	50.9	22.8	0.25	22.20	22.45	Pass.
E.C.-14	Plee-Zing, Inc., Chicago, Ill. *Plee-Zing Maine Blueberries*	56.9	17.8	5.59	11.18	16.77	Pass.
E.S.-1554	H. G. Prince & Co. Div. of California Packing Corp., Fruitvale, Cal. *H. G. Prince Co.'s Yellow Cling Sliced Peaches*	.....	21.6	11.90	7.95	19.85	Pass.
J.W.-910	Royal Canning Co. of Utah, Ogden, Utah. *Royal Brand Light Sweet Unpitted Cherries*	.....	23.8	7.52	12.04	19.56	Pass
E.S.-1557	Santa Cruz Fruit Packing Co., Oakland, Cal. *Santa Cruz Whole Unpeeled Apricots*	.....	16.2	3.72	9.95	13.67	Pass.
K.F.-1235	Sea-Land Frosted Foods Corp., Boston, Mass. *Sea-Land Selected Blueberries*	43.3	17.5	3.28	14.23	17.51	Low in drained solids.
K.F.-1293	Sea-Land Frosted Foods Corp., Boston, Mass. *Sea-Land Selected Blueberries*	39.1	.....	.....	.....	.....	Low in drained solids.
K.F.-1294	Sea-Land Frosted Foods Corp., Boston, Mass. *Sea-Land Selected Blueberries*	47.5	.....	.....	.....	.....	Low in drained solids.
E.S.-1552	Washington Canners Co-Operative, Vancouver, Wash. *West Peak Brand Apricot Halves*	.....	17.6	2.94	11.64	14.58	Not heavy syrup as claimed.
E.S.-1558	Watsonville Canning Co., Watsonville, Cal. *Bird Valley Brand Peach Halves*	.....	15.8	9.43	4.24	13.67	Pass.

Analyses were as follows:

	E.C.-727	*E.S.-1654*	*E.S.-1810*
Solids	16.01	15.87	15.94
Ash	0.31	0.25	0.19
Total acidity	0.97	0.71	0.71
Tartaric acid	0.63	0.57	0.58
Total sugars (as invert sugar)	13.65	14.15	14.28
Non-sugar solids	2.36	1.72	1.66
Phosphoric acid (P_2O_5), mgm./100 cc.	26.2	18.2	18.1

The "Bedford" grape juice was passed, but the analyses of both samples of the "Grape Valley" brand indicated that they contained about 34 per cent of added water.

The one sample of cherry juice, *E.S.-1693*, contained 15.90 per cent solids and 0.40 per cent ash; it was passed.

Gelatine Desserts and Pudding Mixes

One gelatine dessert powder and five pudding mixes were examined for the Commissioner.

E.S.-1708, "Kennedy's Gelatine Dessert Powder", made by Kennedy Dessert Co., Inc., New York, N. Y., was misbranded because, although the flavor was artificial, it was not labelled "imitation cherry flavor".

A.F.-1042, "Butterich Cream Chocolate Flavor Fudge Pudding", made by Butterich Cream Products Corp., Boston, Mass., made claims for a "liberal butterfat content" that were not justified by the 2.15 per cent of butter fat that was present. The product was not a "pudding", but a pudding mix.

One sample examined only for labeling was passed; the analyses of three other samples that were also passed are of interest:

K.N.-1179. Butterscotch Flavor Dessert Makin's. Muffin Makin's Co., Inc., New York, N. Y. Moisture, 3.48; ash, 1.10; starch, 22.53; sucrose, 25.03, and dextrose, 46.84 per cent.

K.N.-1177. Special Chocolate Flavor Pudding. Muffin Makin's Co., Inc., New York, N. Y. Moisture, 4.50; ash, 1.55; protein, 4.19; starch, 21.48; sucrose, 32.72, and dextrose, 28.48 per cent.

K.N.-1178. Vanilla Flavor Dessert Makin's. Muffin Makin's Co., Inc., New York, N. Y. Moisture, 4.08; ash, 0.57; sucrose, 35.45; dextrose, 32.63, and starch, 25.29 per cent.

Honey

Eleven official and nine unofficial samples of honey were examined. The following nine official samples were passed:

E.S.-4. Clover Maid Pure Honey. Clover Maid Products Co., Sioux City, Iowa.

E.S.-1830: Farmers' Gold 100% Pure Honey. Bee Line Honey Co., Alhambra, Cal.

E.C.-798. Golden Blossom Honey. John G. Paton Co., Inc., New York, N. Y.

E.C.-692 and 796. Sioux Bee Brand Pure Honey. Sioux City Honey Association, Sioux City, Iowa.

E.S.-1819. Susan Baker Pure Honey. Susan Baker Products, Inc., New York, N. Y.

E.S.-3. 3 Bees Pure Honey. Western Honey Producers, Sioux City, Iowa.

E.S.-1821. U. S. Fancy Grade Honey. Juan L. March S. de R. L., Tampico, Mexico.

E.S.-1777. Wildflower Mother's Pantry Pure Honey. Allied Molasses Co., Perth Amboy, N. J.

Two official samples were adulterated with glucose:

E.C.-683 and E.S.-1809. Mother's Pantry Pure Honey. Allied Molasses Co., Perth Amboy, N. J.

An unofficial sample of "Golden Queen Honey", *8631*, made by Engelhardt Bros., Wallingford, Conn., contained many particles of wax. It was probably poorly processed honey from old comb.

The other eight unofficial samples were honeys from hives that had been treated by Mr. J. P. Johnson of the entomology department with sulfathiazole for the control of foul brood. Sulfathiazole content of the honeys ranged from none to 65 parts per million, averaging 35 p.p.m. From 0.78 to 2.54 per cent of sucrose and from 71.74 to 76.00 per cent of invert sugar were present.

Meat and Meat Products

Twenty samples of hamburg, three of Italian pork sausage, two of fried pork skins, and one of "powdered gravy" were submitted by the Commissioner.

Seven of the hamburg samples were adulterated with sulphite. They were obtained at the following markets:

K.C.-507. Mitchell's Inn, Bridgeport.

K.C.-509 and 515. Parkway Restaurant, Norwalk.

K.F.-1209, 1210, 1218 and 1219. Violante & Perrotti, Waterbury.

K.N.-8, hamburg from Lynch's Market, Middletown, contained 0.032 per cent of sodium benzoate, and *K.N.-1104*, hamburg submitted on a consumer complaint, contained particles of lipstick. The other 10 samples were passed.

Two of the pork sausage samples were tested for the presence of beef; none was found. The other sample contained no sulphite.

K.C.-511 and K.F.-1206. "Rolets Fried Pork Skins", manufactured by Rolet Food Products Co., Inc., Brooklyn, N. Y., contained nitrate and, therefore, were made, not from fresh skins, but from skins that had been cured by saltpeter; this fact should have been declared on the label.

According to Webster's Dictionary, mince meat is "a mixture, chopped fine, of raisins, apples, suet, spices, etc., with or without meat". On the authority of this definition mince meat must contain suet even if it does not contain meat. The two following samples neither declared nor contained either suet or meat; they were not, therefore, properly labelled as "mince meat":

E.S.-1653. Brandywine Brand Mince Meat. California Preserving Co., Los Angeles, Cal.

E.S.-1814. Crosse & Blackwell Mince Meat. Crosse & Blackwell Co., Baltimore, Md.

The sample of "powdered gravy", *J.W.-894, "Romar Powdered Gravy"*, made by Romanoff Caviar Co., New York, N. Y., was declared to contain "wheat flour, potato starch, hydrolyzed plant protein (an artificial flavoring), salt, beef extract, beef fat, spices, flavoring, caramel coloring". The packages were not much more than half filled; otherwise the sample was passed.

A sample of hamburg, *9349*, tested for the Commissioner of Domestic Animals, showed no evidence of the presence of any preservative (sulphite, nitrate, nitrite or monochloracetic acid).

Milk and Milk Products

Unfortified Milk and Milk Products

One sample of milk, *J.L.-3446*, from Allen Hill Dairy of Meriden, was submitted by the Commissioner because of a complaint that it tasted bitter. It was found to contain 0.24 per cent of calcium oxide and 0.55 per cent of chlorine instead of the 0.14 per cent and 0.10 per cent respectively of normal milk, thus proving the suspected contamination with brine from the cooling system.

E.C.-685. Oz Ready Mix for Ice Cream. Homix Products, Inc., New York, N. Y. Because of the typographic arrangement, the label of this product appeared to say "Oz Ice Cream"; it was not ice cream but a powdered mixture for making ice cream.

K.C.-485. Yogurt. Dannon Milk Products, Inc., Long Island City, N. Y. "Yogurt" is a product variously stated as being of Bulgarian or Turkish origin prepared by souring milk with cultures of *Bacillus Bulgaricus* or other organisms. In other words, it is very similar to acidophilus milk. The analysis of this sample, as compared with recorded analyses of yogurt[1], was as follows:

	K.C.-485	*Yogurt*
Protein	3.13	3.44—3.60
Fat	3.25	3.50—3.74
Lactose	3.89	3.52—4.16
Lactic acid	1.06	0.79—0.85
Ash	0.66	0.72—0.93

The composition of *K.C.-485* did not differ substantially from the recorded composition of yogurt and the sample was passed.

Sixty-two samples of fluid milk were examined for dairymen and two samples were tested for the New Haven Health Department. Only butter fat was determined on most of these samples. One of the New Haven Health Department samples, *8640*, was tested for the presence of preservatives (formaldehyde, quaternary ammonium compounds, hypochlorites and monochloracetic acid); none was found. Another sample, *8897*, was tested for sucrose with negative results. Two samples of homogenized milk showed no cream separation.

Two samples were goat's milk; one of these, *90*, from the farm of Mrs. Paul Howe of Northford, contained 5.5 per cent butter fat and 14.55 per cent total solids.

1 Winton and Winton, *"Structure and Composition of Foods"*, vol. 3, p. 129.

Vitamin D Milk

Vitamin D milk is standardized to contain 400 U.S.P. units of vitamin D per quart. Since 1935 the Dairy and Food Commissioner has checked the guaranties for this product, the bioassays being made by this laboratory. As a result of the reorganization of state departments by the 1947 legislature, the Dairy and Food Commission was abolished as of July 1. From that date the new Food and Drug Commission took over administration of food laws, except those relating to milk and cream, the supervision of milk and cream being transferred to a new Department of Farms and Markets. The Department of Farms and Markets has continued to submit vitamin D milk samples to this Station for testing.

In the calendar year 1947, 128 samples were examined; results of the assays are shown in Table 4. Ten samples were definitely below the unitage claimed. The percentage of samples fully or substantially meeting guaranties was 92.

In the 13 year period, 1935-1947 inclusive, 1,200 samples have been tested; 92 per cent contained the unitage claimed for them or were sufficiently close to the guaranties to be passed.

Pickles

Five official samples of pickles were examined. Four were passed; the contents of one, *K.F.-1365, Mayfair Set Farm Style Dill Pickles*, packed by Mayfair Food Products, Chicago, Ill., were 4 ounces short of the declared 3 quarts, 5 ounces.

Popcorn

Fifteen samples of popcorn were examined for the Commissioner. Eleven of these made claims for the presence of butter; of these, five were passed and six were adulterated or misbranded:

A.F.-1096, 1097 and 1141. Chums Caramel Coated Pop Corn. Cracker Jack Co., Chicago, Ill. Declared ingredients were "sugar, pop corn, corn syrup, cream, butter, salt, sodium carbonate". These samples contained an average of 1.65 per cent of fat with a butyro refraction of 45.8 at 40° C., which is within the limits for butter fat; samples were passed.

A.F.-1126. Crispettes. Howard Johnson's, Quincy, Mass. Declared ingredients were "popcorn, sugar, molasses, corn syrup, butter, cocoanut oil, salt". These "Crispettes" contained 0.76 per cent of a solid fat with a refraction of 52.5 at 40° C., which is too high for either butter fat or cocoanut oil. Some hardened fat must have been substituted for butter and cocoanut oil.

E.C.-495. "Nibbles" Caramel Popcorn. Gold Medal Candy Corp., Brookly, N. Y. Declared ingredients were "popcorn, sugar, corn syrup, creamery butter, salt, bicarbonate sodium". The fat content was 3.55 per cent; this fat was semi-solid and had a refraction of 49.2 at 40° C., which is too high for butter fat.

K.N.-796. Pop-O Caramel Corn. Food Confections Division of Overland Candy Corp., Chicago, Ill. Declared ingredients were "sugar, pop corn, corn syrup, fresh creamery butter, vegetable shortening, salt, soda, vegetable color added". This sample contained 4.14 per cent of a fat that had a refrac-

TABLE 4. SUMMARY OF ASSAYS OF VITAMIN D MILK

City or Town	Dairy	No. of samples tested	Satisfactory	Passed	Below unitage claimed
Berlin	Johnson's Dairy	3	2	1	.....
	Ventres Dairy	1	1	.....	.....
Bloomfield	Chris Neilsen & Sons	2	2	.....	.....
Bridgeport	Beechmont Dairy	1	1	.....	.....
	Dewhirst Dairy	2	1	.....	1
	Marsh Dairy	3	3	.....	.....
	Mitchell Dairy Co.	3	3	.....	.....
	Round Hill Dairy	1	.....	1	.....
Bristol	Elton's Dairy	3	1	2	.....
	Roberge Dairy	2	2	.....	.....
Clinton	Burr Dairy	2	2	.....	.....
East Hampton	Woodland View Dairy	1	1	.....	.....
East Hartford	J. A. Bergren Farm Dairy	3	2	1	.....
Fairfield	Wade's Dairy	2	2	.....	.....
Greenwich	Round Hill Farms	2	2	.....	.....
Hartford	Bryant and Chapman	2	2	.....	.....
	Cloverdale Dairy	2	1	1	.....
	Farmers' Co-Operative Dairy	2	.....	1	1
	Highland Dairy	1	1	.....	.....
	H. P. Hood & Sons	2	1	1	.....
	Lincoln Dairy	3	3	.....	.....
	R. G. Miller & Sons	3	2	1	.....
Kensington	Ferndale Dairy	3	3	.....	.....
Litchfield	Tollgate Farms	3	2	1	.....
Manchester	Dart's Dairy	3	2	1	.....
	Sunshine Dairy	1	1	.....	.....
	West Side Dairy	3	3	.....	.....
Meriden	E. J. Kaeminer & Son	1	1	.....	.....
	Laurence Bros.	3	1	1	1
Middletown	Brock's Lakeview Dairy	3	1	1	1
	Hillside Dairy	2	1	.....	1
Milford	Cold Spring Dairy	1	1	.....	.....
New Britain	Bayer Milk Co.	3	2	1	.....
	Glendale Creamery, Inc.	1	1	.....	.....
	Heslin Dairy Co.	2	1	.....	1
	A. J. Spring & Sons	2	1	.....	1
New Canaan	Miller Dairy Products, Inc.	1	.....	1	.....
New Haven	General Ice Cream, Inc.	1	.....	1	.....
	H. P. Hood & Sons	1	1	.....	.....
Newington	Eckerts Dairy	4	3	1	.....
	Spring Brook Farm Dairy	3	3	.....	.....
New London	Michaels Dairy	1	1	.....	.....
	Radway's Dairy	2	2	.....	.....
North Haven	Knudsen Bros.	3	3	.....	.....
	Twin Maple Farm	1	1	.....	.....
Norwalk	Horrick's Dairy	2	2	.....	.....
	Strawberry Hill Dairy	2	2	.....	.....
Oakville	Sanford's Overlook Farms, Inc.	2	1	1	.....
Rocky Hill	Charles B. Gilbert	1	1	.....	.....
Springdale	Maplehurst Dairy (Sheffield Farms)	3	3	.....	.....
Stratford	Deering's Dairy	2	2	.....	.....
Thompsonville	Skipton Dairy Co.	2	2	.....	.....
Torrington	Cooperative Dairy, Inc.	3	2	1	.....
	Torrington Creamery	2	2	.....	.....
Wallingford	Liberty Dairy	2	.....	.....	2
Waterbury	Brookside Dairy, Inc.	2	2	.....	.....
	Cashin's Dairy Products, Inc.	2	2	.....	.....
	Worden's Dairy	2	1	1	.....
Webster, Mass.	Deary Bros.	2	2	.....	.....
West Hartford	A. C. Petersen	1	1	.....	.....
West Haven	Clark Dairy	1	1	.....	.....
	Wayside Farm	1	.....	.....	1
Westport	Ferris Dairy	1	1	.....	.....
Willimantic	Butler Dairy	1	1	.....	.....
	Totals	128	98	20	10

tion of 52.5 at 40° C. and a Reichert-Meissl value of 2.69. On the basis of the Reichert-Meissl value, the sample may have contained 0.38 per cent of butter fat. It was passed.

K.C.-521. Popt-Crisp Caramel Corn. Overland Candy Co., Chicago, Ill. Declared ingredients were "sugar, popcorn, corn syrup, fresh creamery butter, vegetable shortening, salt, soda, vegetable oil added". Total fat content was 2.93 per cent; this fat had a Reichert-Meissl value of 5.0, indicating 0.50 per cent of butter fat in the sample. Sample was passed.

E.C.-487 and A.F.-1140. Snacks. Confections, Inc., Chicago, Ill. Declared ingredients were "pure cane sugar, fancy grade pop corn, corn syrup, pure creamery butter, shortening (vegetable and animal), salt, lecithin, baking soda". Average fat content was 2.07 per cent and average refraction was 46.2 at 40° C. No mineral oil was present; the fat definitely was not all butter fat, but the amount could not be estimated because of insufficient material to obtain a Reichert-Meissl value. In any case there could not be sufficient butter present to justify the claim that "It's butter rich" and the other emphases on the presence of butter. Samples were misbranded.

There is a fuller description of the "Snacks" labeling in the 1945 report[1].

K.C.-518 and K.F.-1355. Sunny's Butter Flavored Popcorn. Confections, Inc., Medford, Mass. Declared ingredients were "popcorn, vegetable oil, butter oil, salt with certified coloring". Samples averaged 18.88 per cent of oil with a refraction of 45.5 at 25° C., a Reichert-Meissl value of 7.01 and a Polenske value of 16.7. The oil was probably mostly cocoanut oil; the presence of any butter was doubtful. One sample was short weight 0.3 oz.

Four other popcorn samples were examined for reasons other than claims for the presence of butter:

K.C.-523. "Chee-Zetts" Popcorn. Stan-ton Food Products, Stamford, Conn. This sample was misbranded because of a false ingredient declaration of "potato, vegetable oil, salt" that was probably caused by the use of bags intended originally for potato chips.

J.W.-839 and 840. Saratoga Brand French Fried Pop Corn. Saratoga Popcorn Co., Beverly, Mass. These samples were rancid.

J.W.-853. Zippies. C. & M. Popcorn Co., Lake View, Iowa. The sample was submitted on suspicion of rancidity; it was passed on this ground, but the declaration of one of the ingredients, "animal oil", was not sufficiently specific.

In 1945, 34 samples of popcorn were found to contain mineral oil[1], and three such samples were detected in 1946[2]; this year there were none. This type of adulteration apparently has passed into well deserved oblivion.

Preservatives

Three miscellaneous preservatives were submitted by the Commissioner:

J.C.-3. Bevco Stabilizer. Chandler Laboratories, Inc., Philadelphia, Pa. Declared ingredients were "alkyl, dimethyl, benzyl, ammonium chlorides, sodium chloride, glycerine, certified color". Further statements on the label were "A perfect taste balance achieved through unusual blend of natural salts" and "Caution: Bevco contains less than 2½% pure quaternary ammonium chloride. This quaternary ammonium chloride is poisonous in concentrated form, consequently Bevco is not a finished food product and is for manufacturing use only. Bevco should not be taken internally in the present form". Directions were to "Use ½ ounce to each gallon of bottling syrup or to 6 gallons of finished drink or beverage".

Our analysis showed this preparation to contain 0.73 per cent of a quaternary ammonium compound.

Despite the evasive statements on the label, "Bevco" is no more nor less than a preservative that is admitted by the manufacturer to be poisonous in concentrated form and that is sold by him with the intent that it be added to beverages. Under the law it is irrelevant whether the finished drinks are or are not toxic, because poisonous substances may not be *added* to any food *in any concentration whatever* unless such addition "cannot be avoided by good manufacturing practice". Further, it is doubtful if the manufacturer of "Bevco" can avoid legal responsibility for its use in beverages by labeling it "for manufacturing use only", because one of the legal definitions of "food" is "articles used for components of . . . food or drink for man or other animals", and the label of Bevco plainly states that it is to be added to bottling syrups and finished drinks or beverages. One ignorant bottler did add "Bevco" to his carbonated drinks; this is reported on page 6.

K.N.-7. Man-Ah. Whitaker "Man-Ah", Tulsa, Oklahoma. This product was labelled as a "stabilizer, preservative and seasoning for all kinds of ground meat". The label also declared that "Meat processed with Man-Ah must be labelled as follows: Contains salt, sugar, baking soda and less than 1/10 of 1% benzoate of soda". Analysis showed sodium benzoate 5.19, sodium bicarbonate 4.63, sugar 32.78 and salt (sodium chloride) 54.28 per cent. Tests for sulphite, nitrate, nitrite, quaternary ammonium compounds and monochloracetic acid were negative.

K.C.-508. Unknown white powder found near the meat grinder at the Casino Market, Bridgeport, Conn. The material was potassium nitrite (saltpeter).

Preserves

Nine miscellaneous samples of preserves were examined for the Commissioner. Six of these were passed; five were tested for artificial color and two of these also for saccharin; only the label of the other sample was examined.

The three misbranded samples were the following:

E.C.-16. Cinnama-Tang Jelly. Cinnama-Tang Products Co., Syracuse, N. Y. Sample was an imitation jelly and not so labelled.

K.N.-1039. Mrs. Anna Myer's Pure Homestyle Pectin Mint Jelly. Anna Myer's Pure Foods, Inc., Garfield, N. J. An article containing only pectin, artificial and true mint flavor, coal tar dye, water and sugar is an imitation jelly and should be so labelled.

E.S.-1784. Tebbetts Brand Orange Marmalade. Sandune Products Co., Holliston, Mass. The sample was labelled as "made from orange, grapefruit, lemon and sugar". There is no standard for orange marmalade; while cookbooks recognize that some lemons may be added to the oranges in making orange marmalade, grapefruit is not a normal ingredient. This product should have been labelled "Orange, Grapefruit and Lemon Marmalade".

[1] *Conn. Agr. Expt. Sta., Bul.* 499, 17 (1946).
[2] *Conn. Agr. Expt. Sta., Bul.* 510, 23 (1947).

Salad Dressings and Mayonnaise

Twenty official and two unofficial samples of various types of salad dressing were examined. Six were adulterated or misbranded and 16 were passed.

Mayonnaise

Eleven samples were labelled as "mayonnaise" and all were passed. Mayonnaise must contain not less than 50 per cent of edible vegetable oil, but the average oil content of the mayonnaises on the market is about 78 per cent. Analyses of the 11 samples are given in Table 5; similar analyses were reported in 1937[1].

French Dressing

The essential ingredients of French dressing are oil and vinegar or lemon juice[2]. Of five official samples labelled "French dressing", only one, *K.N.-1013,* "Susan Baker French Salad Dressing", made by Susan Baker Products, Inc., New York, N. Y., contained a substantial amount of vegetable oil (35.73 per cent) and was passed. The others were adulterated:

J.C.-25. Chef's French Style Dressing. Chef's Food Products, Memphis, Tenn. Total oil content, 0.43 per cent.

E.S.-1481. La Fay French Dressing. Daniels Co., Chicago, Ill. Total oil content, 0.83 per cent.

J.C.-11 and J.W.-816. Mrs. Boardman's Leanerzest Non-Fattening Mineral Oil French Dressing. Leanermaise Co., Boston, Mass. The oil was all mineral oil, which is not a permissible ingredient in any foodstuff.

Other Salad Dressings

K.C.-480. Butterich Cream Saladaid Boiled Dressing. Butterich Cream Products Corp., Boston, Mass. Claims for butter richness misleading.

A.F.-1031 and E.S.-1358. Cream-Wipt Dairy Spread. Golden Brand Food Products Co., Philadelphia, Pa. Calculated average composition was: Egg yolk, 10.59; oil and butter fat, 31.03; vinegar, 26.88; sugar, cereal, spices, etc. 15.69, and added water, 15.81 per cent. Samples were passed.

K.C.-532. Gold'N Brand Thousand Island Dressing. Gold'n Foods, Inc., Boston, Mass. One ingredient, "Baexal flour", was not declared by a common or usual name.

9215 and E.S.-1490. Roberts Salad Dressing. Roberts Food Corp., Brooklyn, N. Y. One sample contained 13.76 per cent oil; in the other the emulsion had separated, but both were passed.

Spaghetti and Spaghetti Sauce

Five samples of spaghetti or macaroni sauce and two samples of canned spaghetti were examined for the Commissioner. Both spaghetti samples were passed. The sauces were all examined because of claims for the presence of olive oil; all were passed except the following:

G.S.-648. Donna Maria Macaroni Sauce. Sunny Ridge Packing Co., Hamden, Conn. This sauce was labelled as "made with olive oil—meat—tomatoes —spices". Analysis showed that 5.62 per cent of solid fat with a squalene value of 62 was present. This squalene value indicated that the sauce may have contained as much as 1 per cent of olive oil, but obviously the predominating fatty ingredient was an undeclared solid fat.

[1] *Conn. Agr. Expt. Sta., Bul.* 415, 692-693 (1938).
[2] *Conn. Agr. Expt. Sta., Bul.* 510, 27 (1947).

TABLE 5. ANALYSES OF MAYONNAISE

No.	Manufacturer and brand	Egg per cent	Vegetable oil per cent	Vinegar per cent	Sugar, salt, spices per cent	Added water per cent	Type of oil
444	The Best Foods, Inc., New York, N. Y. *Hellman's*	13.12	77.20	7.00	2.68	0.00	Cottonseed
E.C.-622	Mrs. Boardman's Food Prod. Co., Boston, Mass. *Mrs. Boardman's*	5.15	83.10	6.38	3.97	1.40	Peanut
E.S.-1487	Colonial Food Co., Inc., New York, N. Y. *Colonial*	12.07	75.44	8.62	3.87	0.00	Corn or soy
E.S.-1528	Elm Farm Food Co., Boston, Mass. *Elm Farm*	9.89	66.86	15.39	7.86	0.00	Cottonseed
E.C.-734	H. Filbert, Inc. Baltimore, Md. *Mrs. Filbert's*	14.98	72.61	8.21	4.20	0.00	Corn or soy
E.C.-21	Hi Hat Food Products Co., Providence, R. I. *Hi-Hat*	13.57	73.88	9.25	3.30	0.00	Corn or soy
K.N.-1018	Italian Cook Oil Corp., Brooklyn, N. Y. *Country Fair*	7.36	78.19	13.00	1.45	0.00	Cottonseed
E.S.-1499	Old Dutch Mustard Co., Inc., Brooklyn, N. Y. *Old Dutch*	5.04	78.91	9.25	6.52	0.28	Corn or soy
E.S.-5	Perelli Bros., New Haven, Conn. *Primrose*	5.97	79.45	11.25	3.12	0.21	Corn or soy
E.S.-1569	Roberts Food Corp., Brooklyn, N. Y. *Velvet*	6.52	75.42	11.00	6.79	0.27	Corn or soy
E.S.-1486	Spare-Way Food Products, Brooklyn, N. Y. *Gold Crest*	6.24	80.67	9.17	3.92	0.00	Corn or soy

Spices and Condiments

Eighteen samples of black pepper, three of prepared horseradish, and one each of "concentrated garlic" and "hamburg seasoning" were examined for the Commissioner. Nine were adulterated or misbranded and 14 were passed.

Eleven samples were pure black pepper as labelled. The following seven were adulterated with other materials:

A.F.-1024. Pure Black Pepper. In unlabelled bag from Savage Food Market, Torrington. Contained 47.6 per cent of salt; the balance was almost entirely buckwheat hulls.

K.F.-1190, 1201 and 1202 and A.F.-1018. Pure Black Pepper, B. F. S., Inc., Brooklyn, N. Y. Cottonseed hulls present.

E.C.-636 and E.S.-1664. Rosemarie Pure Black Pepper. Rosemarie Packing Co., Inc., Brooklyn, N. Y. One sample *(E.S.-1664)* contained 6.59 per cent salt; the other *(E.C.-636)* was adulterated with cottonseed hulls.

All three horseradish samples were passed; the "hamburg seasoning" contained no sulphite. Analysis of *K.C.-519*, "Little's Pure Concentrated Garlic", packed by Little and Co., Inc., Chicago, Ill., was as follows: Water, 6.22; protein, 7.94; volatile ether extract, 0.14; non-volatile ether extract, 0.31; total carbohydrates, 81.15; fiber, 1.61, and ash, 2.63 per cent. No starch was detected; the principal carbohydrate of garlic is inulin. Although this sample did not have a very pungent odor, possibly because of loss of volatile oil on dehydrating, it appeared to be straight garlic as labelled.

Two samples of monosodium glutamate, *1105* and *1414*, were examined for a manufacturer of Chinese foods. Monosodium glutamate, the sodium salt of *a*-aminoglutaric acid, is used in foods to impart a meat-like flavor or to intensify other flavors[1]. On the basis of nitrogen determinations, one sample contained 89.68 and the other 88.10 per cent of sodium glutamate.

Spray Residues

Since 1931 apples grown in the orchards of this State have been sampled by agents of the Dairy and Food Commissioner and examined in this laboratory for spray residue. During the season of 1947, nine samples were submitted by the Food and Drug Commissioner. Eight had been sprayed with arsenate of lead; none exceeded the tolerance of 0.050 grain of lead per pound. One was sprayed with DDT and contained 1.6 part per million of this compound, which is far below the tolerance of 7 parts per million.

A sample of maple leaves, *9884*, submitted by a private individual, contained 0.86 per cent of lead arsenate; some raspberries, *9969*, showed no evidence of spray residue. Two samples of peaches submitted by the entomology department contained an average of 6.8 parts per million of DDT; two samples of quinces from the same source contained an average of 12.4 parts per million of the same compound.

Syrups

Ninety official and 22 unofficial samples of syrups were examined. Twenty-eight were fruit or vanilla flavored syrups, either carbonated beverage

[1] *Conn. Agr. Expt. Sta., Bul.* 499, 31 (1946).

base syrups or syrups for preparing beverages in the home; eight were sold as pure maple syrup; 43 were declared to contain some pure maple; 23 were other blended table syrups; three were coffee syrups; three were cane syrups, and one each was carob syrup, chocolate syrup, cane and corn syrup and "manufacturers sugar syrup".

Maple Syrup

There were five official samples sold as "pure maple syrup". All were passed, although *A.F.-1099* had a burnt flavor and probably had been overheated. Three unofficial samples were submitted by the Tyler Products Co., of Pawtucket, R. I., as authentic maple syrups for use in the experiments described later in this report. Analyses are given in Table 6.

TABLE 6. ANALYSES OF MAPLE SYRUP

No.	Manufacturer or distributor and brand	Water per cent	Ash per cent	Winton lead number
A.F.-1099	Bill's Auto Service, Taftville, Conn.	32.36	1.10	2.71
K.F.-1295	Franklin F. Fisk, Sharon, Vt. *Grade B*	33.44	0.85	2.66
E.S.-1689	John O. Hillman, South Griswoldville, Mass. *Massachusetts*	32.27	0.84	2.70
A.F.-1131	Jones Dairy Farm, Fort Atkinson, Wis. *Jones Dairy Farm*	32.52	0.67	1.87
A.F.-1130	New England Maple Syrup Co., Boston, Mass. *Maple Hill*	31.23	0.66	2.10
8339	Tyler Products Co., Pawtucket, R. I. No. B	.....	0.88	2.89
8338	Tyler Products Co., Pawtucket, R. I. No. C	.....	0.84	2.90
8337	Tyler Products Co., Pawtucket, R. I. No. 2	.....	0.72	2.04

Table Syrups Claimed to Contain Pure Maple

Twenty-six samples submitted by the Commissioner and five from other sources were labelled as containing maple syrup, maple sugar or "pure maple flavor". Fourteen were adulterated or misbranded and 17 were passed.

Two methods are usually employed for detecting the presence of maple syrup in mixtures. Maple syrup contains a substantial amount of ash, while a syrup made from refined cane sugar is ash-free. Maple syrup also yields a precipitate with basic lead acetate solution and refined cane sugar syrup does not. This latter fact is the basis of the so-called "lead number", which represents the number of grams of lead precipitated by 100 grams of syrup.

On the basis of analyses of many authentic syrups, Leach's "Food Inspection and Analysis"[1] gives the following values for the ash and lead number of pure maple syrup:

	Maximum	*Minimum*	*Average*
Ash	1.01	0.46	0.60
Lead number (Winton)	2.03	1.19	1.49

It would be expected that if a pure maple syrup that had a lead number of 1.49 were mixed with a cane sugar syrup that had a zero lead number, in the proportion of 15 parts of maple syrup to 85 parts of cane sugar syrup,

[1] 4th ed., p. 592.

the resulting mixture would have a lead number that was 15 per cent of that of the maple syrup, or 0.22. There has been some evidence in the literature, however, that the weights of lead precipitated by maple and cane syrup mixtures are not strictly proportional to the percentages of maple syrup in the mixtures. Snell[1] reports the following comparison between the actual maple content, and the maple content calculated from the lead numbers of the pure maple syrups, for several mixtures:

Actual per cent maple	*Per cent maple calculated from lead number (average for 4 syrups)*
80	77
65	62
50	45

These results would appear to indicate that a calculation of the percentage of maple syrup in a mixture by means of the lead number of the mixture would underestimate the true maple content by about 3 points.

The percentage of ash in a mixed syrup is strictly proportional to the ash contents of the ingredients, and for this reason it is more accurate to determine the amount of maple syrup in a maple and cane sugar mixture by means of the ash than to determine it by means of the lead number. However, this method of calculation is reliable only for mixtures of maple syrup with syrups made from refined cane sugar. When the syrup that is blended with the maple is made from an unrefined sugar, that itself contains an appreciable amount of ash, the method is worthless. Some of these unrefined syrups may also have measurable lead numbers; there is no satisfactory means of determining the maple content of mixtures of such syrups with maple syrup.

Some of the table syrups on the market are labelled to contain definite percentages of maple syrup, while others declare maple syrup as one of the ingredients without specifying the amount. Some brands were found to have zero lead numbers; obviously, these contained no maple at all and were misbranded. Some others that declared quantitative amounts, such as 15 per cent, of maple syrup, showed on analysis percentages of ash and/or lead numbers that were less than 15 per cent of the minimum recorded values for pure maple syrup. Such brands we have considered also to be misbranded.

Because of the fact that some evidence did exist that the lead numbers of mixtures of cane and maple syrups might be lower than would be expected from the maple content of such mixtures it seemed advisable, however, to conduct experiments of our own with known mixtures of pure maple and cane sugar syrups. Three pure maple syrups were supplied by the Tyler Products Co. of Pawtucket, R.I.; the analyses of these, *8337 to 8339*, are given in Table 6. A 70 per cent solution of cane sugar was made in this laboratory, and mixtures of this syrup with each of the pure maple syrups were prepared that contained 5, 10, 15 and 20 per cent of maple syrup. The lead number was determined on each of these mixtures, as well as on the cane sugar syrup. Average results for the preparations from all three maple syrups were as follows:

[1] *J. Assoc. Official Agr. Chem.*, 16, 172 (1933).

Actual maple syrup, per cent	*Lead no. found*	*Lead no. calculated from maple syrup present*	*Lead no. found, corrected for lead no. of cane syrup*
0	0.19	0.00	0.00
5	0.32	0.13	0.14
10	0.46	0.26	0.29
15	0.62	0.39	0.46
20	0.74	0.52	0.59
100	2.61	2.61	2.61

It will be seen that for our mixtures, in the low maple concentrations that we investigated, the lead numbers by actual determination were higher rather than lower than they would have been calculated to be from the known lead numbers of the pure maple syrups and their proportions in the mixtures. This means, of course, that lead number determinations would over- rather than underestimate the maple syrup concentrations of mixtures; any error would be in the manufacturer's favor. The reason for this is quite evidently the fact that a syrup prepared from ordinary refined cane sugar does not have an absolutely zero lead number; as will be seen from the last column of the table, when the determined lead numbers are corrected by the amounts of lead precipitate due to the cane sugar syrup present in the mixtures, the determined lead numbers agree very closely with the calculated values.

Ash determinations were also made on these mixtures but are not reproduced here, because the cane sugar syrup had practically no ash (0.006 per cent) and the percentages of ash in the mixtures were strictly proportional to the percentages of maple syrup. (The average ash content of the three maple syrups was 0.81 per cent.)

Analyses of the commercial table syrups claimed to contain some pure maple are given in Table 7.

Other Blended Table Syrups

Twenty-three official samples of pancake syrups that made no claims for the presence of maple syrup but were labelled as containing "artificial maple flavor", etc., were examined; 10 were passed. Only the moisture content was determined on most of these; these syrups, since they are maple syrup substitutes, should contain no more water than is permitted for maple syrup, namely, 35 per cent. The following 13 samples contained moisture in excess of this amount:

No.	Manufacturer or distributor and brand	Water per cent
K.C.-522	Atlas Syrups, Bayonne, N. J. *Atlas*	44.10
K.C.-526	Atlas Syrups, Bayonne, N. J. *Atlas*	44.57
E.S.-1703	Dorchester Food Products Co., Boston, Mass. *Mt. Vernon*	37.06
E.C.-689	Foodline Supply Co., Brooklyn, N. Y. *Food Line*	37.54
E.S.-1509	Gladdy Sales Co., New York, N. Y. *Carole*	51.84
E.S.-1526	Malone Packing Co., Cambridge, Mass. *Malone's*	42.65
K.N.-1102	Mt. Auburn Food Products, Watertown, Mass. *Jean's*	41.61
E.S.-1562	Mt. Auburn Food Products, Watertown, Mass. *Jean's*	39.85
E.C.-604	Mylo Foods Co., Brooklyn, N. Y. *Goody*	41.46
K.F.-1229	Orchard Products Corp., Boston, Mass. *Taste Rite*	41.35
K.F.-1234	Orchard Products Corp., Boston, Mass. *Taste Rite*	40.85
K.N.-1151	Orchard Products Corp., Boston, Mass. *Taste Rite*	40.62
E.S.-1498	Standard Beef Co., New Haven, Conn. *Imitation Maple*	40.74

K.C.-522 and 526, "Atlas Pancake Syrup", were also moldy.

TABLE 7. ANALYSES OF SYRUPS CLAIMED TO CONTAIN PURE MAPLE

No.	Manufacturer or distributor and brand	Water per cent	Ash per cent	Winton lead number	Maple syrup claimed	Remarks
E.S.-1820	Susan Baker Products, Inc., New York, N. Y. *Susan Baker*	21.79	0.13	0.31	15%	Pass.
K.N.-1029	Big Maple Food Products, New York, N. Y. *Big Maple*	40.61	1.16	0.84	present	Adulterated; label of "Pure Maple Pancake Syrup" grossly misleading.
E.S.-1501	Big Maple Food Products, New York, N. Y. *Big Maple*	41.75	0.91	2.24	pure maple flavor	Adulterated; label of "Pure Maple Pancake Syrup" grossly misleading.
E.S.-1517	Big Maple Food Products, New York, N. Y. *Big Maple*	44.32	0.87	2.09	pure maple flavor	Adulterated; label of "Pure Maple Pancake Syrup" grossly misleading.
K.C.-520	Dryden and Palmer, Inc., Long Island City, N. Y. *D. & P. Old Time*	29.34	0.24	0.61	present	Pass.
E.C.-649	Embassy Products Co., Boston, Mass. *Embassy*	32.25	0.27	0.22	pure and imitation maple flavor	Pass.
E.S.-1566	Embassy Products Co., Boston, Mass. *Embassy*	31.45	0.31	0.37	pure and imitation maple flavor	Pass.
K.F.-25	First National Stores, Seymour, Conn. *Timber Lake*	33.36	0.11	0.68	15%	Pass.
K.F.-1188	Garber-Eagle Oil Corp., Brooklyn, N. Y. *Pride of the Home*	35.25	0.06	0.09	present	No maple syrup present; adulterated.
K.F.-1199	Garber-Eagle Oil Corp., Brooklyn, N. Y. *Pride of the Home*	35.22	0.07	0.11	present	No maple syrup present; adulterated.
K.F.-1200	Garber-Eagle Oil Corp., Brooklyn, N. Y. *Pride of the Home*	35.23	0.08	0.05	present	No maple syrup present; adulterated.
K.N.-1034	Garber-Eagle Oil Corp., Brooklyn, N. Y. *Pride of the Home*	35.93	0.07	0.34	present	Pass.
E.S.-1513	Great Atlantic & Pacific Tea Co., New York, N. Y. *Ann Page*	33.99	0.07	0.17	present	No maple syrup present; adulterated.
K.F.-1384	Great Atlantic & Pacific Tea Co., New York, N. Y. *Ann Page*	33.32	0.14	0.52	15%	Pass.
E.S.-1665	Francis H. Leggett & Co., New York, N. Y. *Premier*	32.86	0.07	0.06	15%	Deficient in maple syrup.
E.S.-1568	Malone Packing Co., Cambridge, Mass. *Malone's Maple Queen*	32.89	0.67	0.84	15%	Pass.
A.F.-25		35.74	0.21	0.34	present	Words "Maple Queen Syrup" are misleading.

TABLE 7. ANALYSES OF SYRUPS CLAIMED TO CONTAIN PURE MAPLE (Concluded)

E.S.-1774	Natural Sugars, Inc., Burlington, Vt. *Early Morn*	31.55	0.16	0.35	15%	Pass.
9885	Edward Nigretti, New Haven, Conn. *Maplesweet*	35.26	.....	.....	pure maple flavoring	Name "Maplesweet" is misleading.
E.S.-1669	Penick & Ford, Ltd., Inc., Burlington, Vt.	32.25	0.13	0.14	present	Pass.
A.F.-1083	Preston Products Corp., Yonkers, N. Y. *Scotch Lassie*	32.11	0.48	1.41	pure maple flavor	Pass.
286	Sparkling Beverages, New Haven, Conn. *Eversweet*	34.39	.....	.....	pure maple flavoring	Pass.
E.C.-587	Tyler Products Co., Pawtucket, R. I. *Tyler's*	33.73	0.08	0.07	15%	Deficient in maple syrup.
E.C.-598	Tyler Products Co., Pawtucket, R. I. *Tyler's*	33.76	0.13	0.10	15%	Pass.
8527	Tyler Products Co., Pawtucket, R. I. *Tyler's*	.....	0.08	0.43	15%	Deficient in maple syrup.
8528	Tyler Products Co., Pawtucket, R. I. *Tyler's*	.....	0.06	0.30	15%	Deficient in maple syrup.
8817	Tyler Products Co., Pawtucket, R. I. *Tyler's*	.....	0.13	0.18	15%	Pass.
A.F.-55	Vermont Maple Orchards, Inc., Burlington, Vt. *Farmer Rich*	31.66	0.25	0.62	25%	Pass.
K.F.-1176	Vermont Maple Syrup Co., St. Johnsbury, Vt. *Idlewood*	33.72	0.17	0.60	15%	Pass.
A.F.-1127	Vermont Maple Syrup Co., St. Johnsbury, Vt. *Idlewood*	32.47	0.30	0.74	present	Pass.
E.S.-1663	R. C. Williams & Co., Inc., New York, N. Y. *Royal Scarlet*	31.80	0.46	0.62	15%	Pass.

Fruit and Vanilla Flavored Syrups

Twenty-eight official samples of fruit or vanilla flavored syrups were examined; some were carbonated beverage syrup bases and some were intended for dilution to make beverages in the home. Twelve were passed and 16 were adulterated or misbranded. Analyses of adulterated and misbranded samples are given in Table 8.

Coffee Syrups

The following three samples of coffee syrup were submitted by the Commissioner:

E.C.-634. "Oland" Coffee Syrup. Oland Extract Mfg. Co., Providence, R. I. Declared ingredients were "sugar, water, coffee, corn syrup, 1/10 of 1% benzoate of soda".

E.C.-654 and 690. "Villasweet" Coffee Syrup. Concordade Co., Providence, R. I. Declared ingredients were "pure cane sugar, dextrose, sugar color, extractives of choice blended coffee beans, preserved with 1/10 of 1% benzoate of soda".

Analyses were as follows (coffee content calculated on the basis of an average of 1.21 per cent caffeine in coffee):

	E.C.-634 *per cent*	*E.C.-654* *per cent*	*E.C.-690* *per cent*
Water	55.05	37.22	62.51
Sucrose	29.51	.....	26.22
Invert sugar	6.56	.....	1.40
Caffeine	0.131	.....	0.212
Coffee	10.8	.....	11.2

E.C.-654 was fermenting; the other samples were passed.

Miscellaneous Syrups

Five miscellaneous official samples were examined; all were passed:

E.S.-1489. Gold's Pure Chocolate Flavored Syrup. Gold Food Products Co., Brooklyn, N. Y. Declared ingredients were "cocoa, sugar, pure vanilla, water". Water content was 38.21 per cent; sample was passed.

K.C.-481. Flo-Sweet Manufacturers Sugar Syrup. Flo-Sweet Products Corp., Yonkers, N. Y. Analysis was as follows: Total solids, 77.80; ash, 0.051; sucrose, 36.86; invert sugar, 36.85, and glucose, 2.35 per cent.

A.F.-1078 and K.N.-1032. Flo-Sweet Sugar Cane Golden Syrup. Flo-Sweet Products Corp., Yonkers, N. Y. Analysis was as follows: Solids, 68.30, and ash, 0.98 per cent.

E.C.-640. Refiners Residual Cane Syrup and Corn Syrup. A. J. Bentley & Sons, New London, Conn. Analysis was as follows: Moisture, 19.35, and glucose, 1.67 per cent.

One sample of carob syrup, *9345*, was examined for a manufacturer. This syrup was prepared from the seeds of a tree also known as "St. John's bread" and "honey locust".[1] It is called "St. John's bread" because its seeds and pods are supposed to have been the "locusts and wild honey" on which John the Baptist subsisted in the wilderness. Our sample contained 21.18 per cent of moisture, 39.77 per cent of sucrose and 21.09 per cent of invert sugar, or 60.86 per cent total sugars.

[1] Winton and Winton, *"The Structure and Composition of Foods"*, vol. 2, p. 671.

TABLE 8. ADULTERATED OR MISBRANDED FRUIT AND VANILLA FLAVORED SYRUPS

No.	Manufacturer or distributor and brand	Water per cent	Remarks
E.S.-1	Allied Fruit & Extract Co., Inc., New York, N. Y. *Dainty Maid True Fruit Strawberry*	31.14	Contained 1.76 mgm. vitamin C per oz., which is less than the 1/5 daily requirement claimed.
E.C.-726	Arvin Syrup Co., Brooklyn, N. Y. *Arvin Brand Orange*	90.57	Saccharin present; sample was not a syrup.
E.C.-783	Arvin Syrup Co., Brooklyn, N. Y. *Arvin Brand Vanilla*	89.70	Saccharin present; sample was not a syrup.
E.S.-1706	W. Burton & Co., Inc., Brooklyn, N. Y. *Burton's Raspberry*	30.54	Ingredients not properly declared.
G.S.-646	Connecticut Syrup Co., Bridgeport, Conn. *Mor Brand Mor-Cola*	.....	Contained only 23.08 per cent of invert sugar.
E.S.-1782	Connecticut Syrup Co., Bridgeport, Conn. *Mor Brand Orange*	60.95	Excessive water.
E.S.-1781	Connecticut Syrup Co., Bridgeport, Conn. *Mor Brand Strawberry*	61.34	Excessive water; flavor was artificial; should be labelled "imitation strawberry".
E.S.-1811	Herbert Candy Co., New Haven, Conn. *Vanilla*	47.26	Excessive water.
E.C.-688	J & J Food Sales Co., Brooklyn, N. Y. *Arco Brand Grape*	81.57	Saccharin and dulcin present; excessive water; total sugars 16.35 per cent.
K.F.-1371	J & J Food Sales Co., Brooklyn, N. Y. *Arco Brand Orange*	80.83	Dulcin present; excessive water.
K.F.-1372	J & J Food Sales Co., Brooklyn, N. Y. *Arco Brand Strawberry*	82.37	Saccharin present; excessive water.
K.F.-1370	J & J Food Sales Co., Brooklyn, N. Y. *Arco Brand Vanilla*	81.78	Saccharin present; excessive water.
J.C.-2	Nobby Bottling Co., New Britain, Conn. *Orange*	.....	Quaternary ammonium compound present.
K.F.-1356	Ribo Food Sales Co., Brooklyn, N. Y. *Almo Brand Orange*	64.88	Excessive water.
K.C.-506	Rose Brand Syrup, New York, N. Y. *"Suk" Orange*	.....	Ingredients not properly declared.
E.S.-22	Wilco Sales Co., Hamden, Conn. *Wilco Orange*	50.29	Excessive water; ingredients not properly declared.

Vegetables, Canned

Thirty-three official and two unofficial samples of canned vegetables were examined. Twenty were sweet potatoes, four were tomatoes, three were mushrooms, three were peas, four were sweet peppers and one was corn. Twelve samples were passed and 23 were adulterated or misbranded.

Sweet Potatoes

For sweet potatoes to be labelled "packed in syrup", the liquid portion of the contents of the can should contain not less than 14 per cent of total sugars. Of the 19 official and one unofficial samples of canned sweet potatoes labelled "in syrup", "syrup pack" or "in medium syrup", representing four brands, one sample was passed and 19 were considered misbranded. The brands and the analyses were as follows:

	Total sugars, per cent			*No. samples*	
Manufacturer and brand	*maximum*	*minimum*	*average*	*passed*	*mis-branded*
Colonial Cannery, Inc., Independence, La. *C. and C.*	17.45	11.46	13.66	1	6
Southern Shell Fish Co., Inc., New Orleans, La. *Blue Plate*	7.59	7.59	7.59	....	1
H. J. McGrath Co., Baltimore, Md. *Champion*	13.84	13.54	13.69	....	2
Warriner Products Co., Inc., Baton Rouge, La. *Marydale*	11.96	9.59	10.36	....	10

Tomatoes

Federal standards require that the drained weight of canned tomatoes be not less than 50 per cent of the weight of water required to fill the container, and that the total contents occupy not less than 90 per cent of the total volume of the container. The following four samples, representing two brands, all met these requirements:

K.F.-1418. Mi-Best Brand. Chicago Macaroni Co., Chicago, Ill., and Brooklyn, N. Y. Drained weight, 63 per cent.

E.S.-1362, 1363 and 1364. Connecticut Pride Brand. Orange Canning Co., Orange, Conn. Average drained weight, 68 per cent.

Mushrooms

Three official samples of canned mushrooms were examined because of claims that they were broiled or sautéed in butter. The fat extracted from these samples appeared to be straight butter fat, and the samples were passed. The following two brands were represented:

K.C.-342 and E.C.-575. B in B Broiled in Butter Mushrooms. Grocery Store Products Co., West Chester, Pa.

E.C.-574. Oxford Royal Buttons Mushrooms Sauté in Butter. Lescarboura Mushroom Co., Kelton, Pa.

Peas

Federal standards for canned peas require, among other things, that the alcohol-insoluble solids of Alaska or other smooth-skinned varieties be not more than 23.5 per cent, while the alcohol-insoluble solids of sweet, wrinkled varieties may not be more than 21 per cent. Of two official and one unofficial

samples examined, one came sufficiently close to the standard to be passed; the others were misbranded:

9968. Evelyn Run of Pod Early June Peas. Melrose Canning Co., Melrose, Md. Alcohol-insoluble solids, 23.98 per cent; pass.

K.C.-470. Monteagle Brand Standard Quality Sweet Peas. Tugwell and Wiseman, Inc., Modeltown, N. Y. Alcohol-insoluble solids 23.97 per cent; below standard; not sweet peas as labelled.

K.C.-499. Navarre Brand Sweet Peas. Springfield Sugar and Products Co., Springfield, Mass. Alcohol-insoluble solids 26.68 per cent; below standard.

Sweet Peppers

K.F.-1338 and 1339 and E.S.-1474 and 1484, "Pee-Gee Brand Sweet Red Peppers", packed by Giambanco Packing Co., Oakdale, Cal., were tested for fill of container and net weight. These four samples represented 11 cans; the drained weight of peppers averaged 72.6 per cent of the contents, but four cans were short weight and another contained only 41 per cent peppers.

Corn

The one sample of corn was examined only for labeling and was passed.

Vinegar

Thirteen samples of wine vinegar, three of cider vinegar and seven of blended vinegars were examined for the Commissioner. Sixteen were passed and seven were adulterated or misbranded. In addition, acidity was determined for a vinegar manufacturer on 130 samples of cider vinegar and hard cider.

Cider Vinegar

Two of the three official cider vinegar samples were passed. The other, *E.C.-18,* "Sweet Life Pure Cider Vinegar", distributed by Sweet Life Food Corporation, Brooklyn, N. Y., which was labelled "full strength", contained only 1.51 per cent of total solids, which is below the minimum of 1.60 per cent required by Section 3896 of the General Statutes for undiluted cider vinegar. It should have been labelled "Reduced to 5 per cent acidity" (acidity was 5.05 per cent).

Wine Vinegar

In 1946[1] a rather extensive survey showed that much of the wine vinegar on the market was grossly adulterated. At that time at least 55 out of 78 samples, or 71 per cent, were adulterated. This year only 13 samples were examined and all except four of these were passed.

It is obvious that "pure wine vinegar" must be defined before it can be decided whether a particular sample sold as wine vinegar is or is not adulterated. For legal purposes this question has been answered by a Food Inspection Decision of the U. S. Department of Agriculture issued in 1926[2], as follows:

"Wine Vinegar, Grape Vinegar, is the product made by the alcoholic and subsequent acetous fermentations of the juice of grapes, and contains, in

1 *Conn. Agr. Expt. Sta., Bul.* 510, 35-37 (1947).
2 *Analyst,* 51, 579 (1926).

one hundred (100) cubic centimeters (20° C.) not less than four (4) gms. of acetic acid."

Some "wine vinegar" of the trade is made by the acetic fermentation of wines that have spoiled. If these wines are table wines made by the alcoholic fermentation of grape juice only, the resulting products may meet the Federal definition for wine vinegar. If they are sweetened fortified wines such as port, the product of their acetic fermentation is not pure wine vinegar but a mixture of wine vinegar with sugar vinegar and distilled vinegar.

In order to determine by chemical analysis whether a particular sample of vinegar is pure or adulterated, it is necessary to have information on the chemical composition of wine vinegars known to be pure. It was pointed out in the 1946 Report[1] that there are not many detailed analyses of wine vinegar in the literature. At that time reliance was chiefly placed on analyses of six authentic wine vinegars reported in a confidential communication of the Bureau of Chemistry of the U. S. Dept. of Agriculture issued in 1914. Since that time, permission has been obtained[2] for the reproduction of these figures, and a more exhaustive search of the literature has uncovered additional analyses. All of these are summarized in Table 9.

Although most of these analyses are old, the agreement of the various sources is sufficient to establish the average composition of pure wine vinegar as being about as follows:

	Grams per 100 cc.
Total solids	2.01
Ash	0.32
Total acidity as acetic acid	6.35
Tartaric acid	0.12

An inspection of Table 9 will show that the total solids content of wine vinegar varies over such wide limits as to make this determination of no value in determining anything except the grossest contamination. There is also a rather wide spread in the reported figures for the total acidity of supposedly authentic wine vinegars (some of the lower values are undoubtedly due to incomplete fermentation). The percentages of ash show much less variation, and it may be stated with reasonable certainty that a vinegar containing less than 0.12 per cent of ash is adulterated.

Determinations of tartaric acid are in a special class, because tartaric acid is not found in any vinegar except that made from the grape. In our 1946 inspection we found some samples sold as "pure wine vinegar" that contained little or no tartaric acid. Because they were apparently naturally colored and showed reasonably high solid and ash figures we did not condemn them at that time, owing to the paucity of our information on what the limits for the tartaric acid contents of wine vinegar were. Table 9 would appear to indicate that an authentic wine vinegar may contain no tartaric acid. However, the statements of Villiers and Collin[3] are pertinent on this point:

"When one has found weights of cream of tartar and extract lower than the above limits, and a ratio of acetic acid to extract higher than these limits, the vinegar manufacturer often gives an explanation that is plausible and perhaps even sometimes true. Wines which are sent to the vinegar factories are often spoiled or altered by the action of ferments, and the degree of change

[1] *Conn. Agr. Expt. Sta., Bul.* 510, 35-37 (1947).
[2] Letter of H. A. Lepper, Sept. 16, 1948.
[3] A. Villiers and E. Collin, "*Traite des Alterations et Falsifications des Substances Alimentaires*", pp. 1032-1033 (Paris, 1900).

TABLE 9. PUBLISHED ANALYSES OF PURE WINE VINEGAR

Source	No. of samples	Total solids, per cent			Total ash, per cent			Total acidity as acetic acid, per cent			Tartaric acid, per cent		
		Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.
A. W. and M. W. Blyth, "Foods; Their Composition and Analysis", 5th ed., London, 1903	....	3.19	1.38	1.93	0.68	0.16	0.32	7.58	4.44	6.33	.....	.....	.....
Louis Calvet, "Alcohol Methylique Vinaigres" (Quoted by Conover)	24	2.18	1.13	.....	0.36	0.18	.....	8.15	5.55	.....	0.45	0.15	.....
Courtney Conover, Bureau of Chemistry, U. S. Dept. of Agriculture (1914) (unpublished)	6	2.97	1.89	2.43	0.36	0.23	0.32	10.06	6.02	7.98	0.19	0.08	0.14
C. Girard and A. Dupré, "Analyse des Matières Alimentaires", Paris, 1894	22	3.20	1.38	1.93	0.69	0.16	0.32	7.38	4.44	6.33	0.29	0.05	0.13
J. König and A. Bömer, "Chemie der Menschlichen Nahrungs- und Genussmittel", Berlin, 1903	11	11.85	0.86	4.07	0.52	0.12	0.34	7.79	2.92	4.93	0.23	0.05	0.15
J. König and A. Bömer, "Chemie der Menschlichen Nahrungs- und Genussmittel", Berlin, 1903	13	2.14	1.50	1.81	0.31	0.19	0.23	9.00	4.23	6.56	.....	.....	.....
J. König, J. Grossfeld and A. Splittgerber, "Chemie der Menschlichen Nahrungs-und Genussmittel", Berlin, 1923	3	2.65	0.55	1.52	0.54	0.12	0.28	6.70	5.71	6.16	0.07	0.00	0.03
J. König, J. Grossfeld and A. Splittgerber, "Chemie der Menschlichen Nahrungs-und Genussmittel", Berlin, 1923	19	1.90	0.13	0.68	.....	.....	.....	11.58	2.97	5.69	.....	.....	.....
J. König, J. Grossfeld and A. Splittgerber, "Chemie der Menschlichen Nahrungs-und Genussmittel", Berlin, 1923	3	1.60	1.44	1.54	.....	.....	.....	12.06	9.00	10.91	.....	.....	.....
J. König, J. Grossfeld and A. Splittgerber, "Chemie der Menschlichen Nahrungs-und Genussmittel", Berlin, 1923	17	3.80	1.43	2.46	0.88	0.17	0.39	9.48	4.68	6.55	0.12	0.03	0.08
All sources		11.85	0.13	2.04[1] 2.01[2]	0.88	0.12	0.31[1] 0.32[2]	12.06	2.92	6.83[1] 6.35[2]	0.45	0.00	0.11[1] 0.12[2]

[1] Giving equal value to each source.
[2] Weighted for number of samples in each source.

that they have undergone is such that they could not be drunk as such, even after being blended with other wines.

"If the change in these wines is only an incipient acetification, caused purely by action of the acetifying ferment, there is naturally no bar to their use in vinegar factories; they yield a vinegar of normal composition. But the case is different when, in the presence or absence of the acetifying ferment, other ferments have intervened. We have seen that these other ferments produce a profound modification in the composition of the wine. Under the influence of *Mycoderma vini*, for example, a large proportion of the extractive materials can be destroyed and the weight of the solids reduced by a fourth or a third. It is the cream of tartar above all that disappears the quickest, and if the ferment has acted for a long time in the presence of air cream of tartar can scarcely be found in the vinegar.

"It is therefore certain that a vinegar manufactured from an altered wine may contain little solids and, particularly, little cream of tartar; such a vinegar is hardly distinguishable by analysis from a wine vinegar diluted with distilled vinegar. The expert should therefore be cautious in drawing his conclusions; but if it is not always possible for him to state that distilled vinegar has been added, when the results obtained do not conclusively prove such addition, he can always conclude that the vinegar either contains distilled vinegar or has been made from an abnormal wine.

"It seems to us that in either case there is equal deception in the nature of the merchandise. A vinegar prepared from a liquid that is wine only in name, whose composition has been completely modified by abnormal ferments, should have no more right to the name 'wine vinegar' than does distilled vinegar, at least unless it is sold as 'wine vinegar made from wine unfit to drink'. Further, a well prepared distilled vinegar, or a well purified wood vinegar, is undoubtedly superior to such a product, for if these do not contain, as such a 'wine vinegar' does not, the substances which give the sought-after 'bouquet' of wine vinegar, at least they do not contain the alteration products of the wine that produce a more or less disagreeable odor and taste."

Villiers and Collin set the maximum ratios of total acidity to solids for normal wine vinegars at 5.52 for vinegars made from red wine and 7.99 for those made from white wine, and the corresponding minimum solids contents as 0.95 and 0.66 gram per 100 cc. They add, however, that "this minimum for solids and maximum for the ratio of acetic acid to extracts are very rarely attained; a normal wine vinegar almost always gives a much higher weight of extract and a lower ratio of acetic acid to extract".

The only definitely authentic wine vinegar that this laboratory has had the opportunity to analyze[1] contained 2.48 per cent solids, 0.40 per cent ash, 5.72 per cent total acidity and 0.186 per cent tartaric acid. The ratio of acidity to solids for this sample was 2.31.

In the light of all these facts we shall feel justified in the future in considering any wine vinegar containing less than 0.12 per cent ash or 0.05 per cent tartaric acid to be adulterated.

Analyses of the 13 samples labelled "wine vinegar" that were examined in 1947 are given in Table 10. On the basis of the lax criteria of adulteration that we used in 1946, all except four of them were passed.

[1] *Conn. Agr. Expt. Sta., Bul.* 510, 36 (1947).

TABLE 10. ANALYSES OF WINE VINEGAR

No.	Manufacturer or distributor and brand	Total solids per cent	Total ash per cent	Total acidity as acetic acid per cent	Tartaric acid per cent	Remarks
K.C.-586	John Alban & Co., New York, N. Y. *Ambrosia*	0.60	0.09	5.40	0.045	Adulterated with water and acetic acid or distilled vinegar.
K.C.-614	John Alban & Co., New York, N. Y. *Ambrosia*	0.61	0.10	5.35	0.030	Adulterated with water and acetic acid or distilled vinegar.
J.C.-652	Chicago Macaroni Co., Chicago, Ill. *Cyrilla*	0.86	0.12	4.70	0.031	Adulterated with water and acetic acid or distilled vinegar.
K.C.-490	Globe Dainties Mfg. Co., Brooklyn, N. Y. *Delmondo*	1.56	0.18	4.68	0.086	Labelled "Legal Strength"; probably diluted with water but pass.
A.F.-1045	Globe Dainties Mfg. Co., Brooklyn, N. Y. *Delmondo*	0.87	0.10	4.85	0.042	Labelled "Legal Strength"; probably diluted with water but pass.
K.F.-1177	Globe Dainties Mfg. Co., Brooklyn, N. Y. *Delmondo*	1.34	0.12	3.57	0.051	Diluted below minimum legal acidity of 4 per cent.
E.S.-2	Krasne Bros., New York, N. Y. *Kay Pak*	1.41	0.19	5.00	0.054	Labelled "Reduced with water to legal strength"; pass.
E.S.-1567	Francis H. Leggett & Co., New York, N. Y. *Premier*	2.56	0.28	5.43	0.073	Probably somewhat diluted but pass.
E.C.-627	Lekas & Drivas, Chicago, Ill. *Elénadi*	4.42	0.26	5.47	0.018	Pass.
E.S.-1822	Perrelli Bros., New Haven, Conn. *Perrelli*	1.70	0.37	4.64	0.063	Probably diluted but pass.
E.S.-1577	Rosemarie Products Co., Brooklyn, N. Y. *Rose Marie Pure White Wine*	2.93	0.14	5.16	0.032	Probably somewhat diluted but pass.
K.F.-1154	Rosemarie Products Co., Brooklyn, N. Y. *Rose Marie*	1.25	0.54	5.18	0.103	Pass.
K.F.-1291	Gus Sclafani, Stamford, Conn. *Lina*	1.71	0.58	4.50	0.051	Probably diluted but pass.

Blended Vinegars

These seven samples included three labelled as "Cider-White Vinegar" and four sold as blends of distilled and red wine vinegars.

The three "Cider-White" vinegars, *K.N.-1172 and E.S.-7 and 8*, were all "Very-Fine" brand, made by New England Apple Products Co., Littleton, Mass. They were declared to be "a mixture of 50% cider vinegar and 50% white vinegar". Two were passed; the other contained caramel color, which is not permitted under our vinegar statute.

The following four samples of blended distilled and wine vinegars were passed except for one that did not meet its claimed acidity:

K.N.-1033. Barbera Distilled and Wine Vinegar. Unita Packing Co., Providence, R. I. Analysis was as follows: Solids, 0.45; ash, 0.04; total acidity, 4.16, and tartaric acid, 0.008 per cent. Acidity not 5 per cent as labelled.

K.F.-1369. Paramount Distilled and Red Wine Vinegar. Paramount Vinegar Sales Co. "Potassium metabisulfite" declared; 7.9 parts per million of sulphur dioxide found.

K.F.-1363 and 1366. Progresso Distilled and Red Wine Vinegar. Uddo and Taormina Co., Brooklyn, N. Y. "Potassium metabisulfite" declared; 12.4 and 4.6 parts per million of sulphur dioxide found.

Water

Fourteen samples of water were examined for private individuals and the New Haven Health Department, chiefly for hardness and acidity. Four were submitted because of suspected contamination with gasoline; evidence of the presence of gasoline or a petroleum oil was found in two of them. Two samples taken from the Branford River, one at low and one at high tide, showed 0.65 and 1.22 per cent of salt, respectively.

Miscellaneous

Twenty-four miscellaneous samples were examined for the Commissioner. Seven were adulterated or misbranded and 17.were passed.

Maple Butter

The manufacture of maple butter or "maple cream" has been described as follows[1]:

"Maple cream is produced by boiling the sirup to a density slightly heavier than that for a soft sugar and suddenly cooling the product, stirring all the time with a large spoon or paddle. This beating and cooling tends to produce microscopic crystals of sugar which give the product a creamy appearance and do not separate out on standing if the proper density is maintained. An early run of sirup is not the best for this product, as some inversion of the sucrose is necessary to obtain the best results. This product has been called maple butter in some sections and is frequently prepared by farmers."

Maple butter is, therefore, a product prepared by the condensation of maple sap, and contains no ingredient other than maple. Of two official samples sold for "maple butter", one, *K.F.-1416, Highland 100% Pure Vermont Maple Butter*, made by Cary Maple Sugar Co., St. Johnsbury, Vt., corresponded to this composition and was passed. The other was adulterated:

[1] Bryan, Straughn, Church, Given and Sherwood, *U. S. Dept. Agr., Bul.* 466, 41 (1917).

K.F.-1415. Gilford's Home Style Maple Butter. Gilford's, Waterbury, Conn. Declared ingredients were "cane sugar, glucose, milk, butter, flour and artificial flavoring". Analysis showed 0.60 per cent ash and a lead number of 1.12. This product should have been labelled "imitation maple butter".

The other six adulterated or misbranded samples were the following:

A.F.-1079. Bordens Instant Mix for Making Hot Chocolate Drinks. The Borden Co., New York, N. Y. Statements such as "Just add hot milk or water for delicious hot chocolate" were false, since hot chocolate can only be made from chocolate, not cocoa. The label was also phrased so as to give the misleading impression that the product contained 22 per cent of vitamin B_1 and 23 per cent of vitamin D.

K.C.-479. Butterich Cream Sauce. Butterich Cream Products Corp., Boston, Mass. Declared ingredients were "A combination of specially blended wheat flour, milk and butterfat solids; salt, and artificial color". The product was also declared to be "rich in butterfat content". It contained 5.78 per cent of fat with a Reichert-Meissl value of 27.6, which is within the limits for butter fat, but it was not a cream sauce but a powder which might or might not form a cream sauce on mixing with water.

E.S.-1475 and 1480. Del's Selected Salted Nuts. Del's Food Products Co., Newark, N. J. These samples consisted of two cards to each of which were attached 24 waxed paper bags containing pistachios, some of which were colored red. The individual bags were unlabelled, and not even the cards declared artificial coloring as is required by law.

E.S.-1510. Fortissimo Brand Fruit Salad & Nut Ice Cream Topping. Burry Sales, Inc., Elizabeth, N. J. This was declared to be "a delicious blend of orange, lemon, grapefruit, citron, melon, cherries, nut meats, sugar, artificial color and flavor, 1/10 of 1% benzoate of soda". No nuts were present and the presence of grapefruit and lemon was doubtful; the sample was also fermenting.

K.F.-51. Lemon Flavor Kre-Mel Pie Filling. Corn Products Refining Co., Argo, Ill. This product was not a complete pie filling; the label itself called for the addition of eggs, sugar and salt to the "filling", which was actually only a lemon-flavored starch thickener.

One other sample that was passed is also of interest:

J.L.-8848. Moench's Mixacoid. R. G. Moench Co., New York, N. Y. Declared ingredients were "mixed fatty acid esters of reduced dextrose, defatted milk solids, dextrose, spray dried egg yolk". This product was sold as a stabilizer for ice cream mixes. According to information from the U. S. Food and Drug Administration[1] the "mixed fatty acid esters of reduced dextrose" were sorbitan monostearate. The probable composition from our analyses was as follows:

	Per cent
Dry skim milk	36.00
Dextrose	10.84
Dried egg yolk	5.84
Sorbitan monostearate (by difference)	47.32

[1] Letter of W. A. Queen, July 29, 1947.

Forty-four unofficial samples were submitted by health departments, police and private individuals, and 40 were passed. The following samples, although not adulterated, are of interest:

8243. Favorite Brand Antipasto. Eastern Packing Co. Calculated composition was as follows: Eggplant, capers, olives and peppers, 32.3; vinegar, 31.0; salt, 2.4: and corn or soy oil, 34.3 per cent.

38, 39, 170, 9988 and 9989. Oranges. Analyses of these five samples were as follows:

Soluble solids, per cent	10.58—13.00
Citric acid, per cent	0.56— 0.92
Total sugars as invert sugar, per cent	8.68—10.32
Ratio of solids to acidity	11.9 —21.8
Ratio of sugars to acidity	8.6 —17.3

109. Royal Cream of Tartar Baking Powder. Standard Brands, Inc., New York, N. Y. Calculated composition was: Sodium bicarbonate, 26.35; tartaric acid, 13.93; cream of tartar, 18.50, and starch, 41.22 per cent.

9033. Sta-Wite Brand Peeled Potatoes. Ralph's Potato Co., Medford, Mass. These potatoes were labelled "contains sulphur dioxide", and 141 parts per million of this compound were found present.

DRUGS

It has been the practice for many years for the Dairy and Food Commissioner to submit annually to this Station about 150 samples of official drugs (that is, drugs recognized by the U. S. Pharmacopoeia or the National Formulary) collected from pharmacies about the State. The purpose of this inspection was to find out to what extent such drugs, as sold in the State, were of standard strength and purity. The percentage of samples found deficient has varied from year to year. For this variation there are apparently several reasons. The general pattern of results has shown that drugs prepared by large manufacturers are less likely to diverge from the official strengths than are those put up by retail pharmacists. The obvious explanation for this is that the manufacturers have control laboratories that analyze all batches of their products while the retail druggists do not. In the second place, if the drug is an old one with which the pharmacist is familiar he is more likely to compound it properly. Thirdly, unstable drugs such as sweet spirits of nitre may be sold after they have become weakened by partial decomposition. The percentage of substandard drugs found on inspection varied, therefore, with the types of drugs that were sampled (whether they were old or new, stable or unstable) and with the relative proportions of them that were purchased by the druggist ready made or compounded by him extemporaneously. Over a period of 40 years probably about 70 per cent of the drug samples analyzed by this Station have been found to be satisfactory and about 30 per cent have been deficient.

For some time it has been realized that sampling of prescriptions would be a much more important means of safeguarding the public health than was the inspection and analysis of simple official drugs, whose manufacture was for the most part already well controlled and which were mostly of such a nature that an over or underdose was of little consequence. There were numerous obstacles in the way of a prescription survey, however, and it was not until 1946 that a beginning was made in this type of inspection. During 1946, 55 prescription samples were obtained by inspectors of the Dairy and Food Commission. Analyses of most of these extended into 1947, and results of analyses made during this year are reported later in this bulletin. Partly because of the time that was required by this laboratory to complete the analyses of these prescription samples, neither the Dairy and Food Commissioner nor his successor, the Food and Drug Commissioner, made any inspection survey of official drugs during 1947 similar to the surveys of past years, with the exception of five samples of saccharin tablets and 18 of cod liver oil and other vitamin D oils.

Cod Liver Oil

Seventeen samples of cod liver oil were assayed for their vitamin D content by feeding to rats and were also analyzed chemically for compliance with the purity limits set by the U. S. Pharmacopoeia. Results are given in Table 11. All except two samples, of which one was "McKesson's", made by McKesson and Robbins, New York, N. Y., and the other was "Nason's", made by Tailby-Nason Co., Boston, Mass., were passed. The Nason sample was known to be old stock; another sample of the same brand passed all tests.

An inspection of the table shows that only four samples had iodine values of less than 160 and, of these, only one showed an entirely satisfactory response when fed to rats at the level indicated by the declared vitamin D

TABLE 11. ANALYSES OF COD LIVER OIL

No.	Manufacturer or distributor and brand	Vitamin D assay	Unsaponifiable per cent	Free fatty acids per cent	Iodine no.	Saponification no.	Remarks
P.S.-946	G. Fox & Co., Hartford, Conn. *Foxco*	O.K.	0.87	0.57	166	180	250 units/gm. vitamin D declared; O.K.
P.S.-948	Dr. Higgins Laboratories, New Haven, Conn. *Higgins U. S. P. XII*	O.K.	0.67	0.59	162	180	"Contains 85 vitamin D units"; should specify "per gram", but pass.
P.S.-962	McKesson & Robbins, New York, N. Y. *McKesson's*	Below standard	0.74	0.35	156	185	Labelled "U. S. P."; did not meet U. S. P. requirements of 85 units/gm. vitamin D.
P.S.-953	Mead, Johnson & Co., Evansville, Ind. *Mead's*	O.K.	0.99	0.22	158	182	175 units/gm. vitamin D declared; O.K.
P.S.-947	Norwich Pharmacal Co., Norwich, N. Y. *Norwich*	O.K.	0.93	1.11	162	184	85 units/gm. vitamin D declared; O.K.
P.S.-955	Olafson Vitamins, Inc., Chicago, Ill. *Norwegian Lofoten U. S. P.*	O.K.	0.87	0.78	166	181	"Two teaspoonfuls daily supply 1 4/5 times daily min. of vit. D for adults"; O.K.
P.S.-950	Parke, Davis & Co., Detroit, Mich. *Parke-Davis*	O.K.	0.95	0.36	163	181	250 units/gm. vitamin D declared; O.K.
P.S.-919	E. L. Patch Co., Boston, Mass. *Patchol Concentrated*	Pass	.....	.....	.....	.....	6,000 units/gm. vitamin D declared; pass.
P.S.-951	E. L Patch Co., Boston, Mass. *Patch's Flavored*	O.K.	0.99	0.79	165	181	200 units/gm. vitamin D declared; O.K.
P.S.-957	Scott & Bowne, Bloomfield, N. J. *Scott's Pure Norwegian*	O.K.	0.83	0.78	165	181	"Guaranteed to exceed U. S. P. standards"; O.K.
P.S.-954	E. R. Squibb & Sons, New York, N. Y. *Squibb*	O.K.	0.91	0.55	163	183	180 units/gm. vitamin D declared; O.K.
P.S.-958	Sunsol Products, Chattanooga, Tenn. *Sunsol*	Pass	1.13	0.29	159	181	"Vitamin D in excess of U. S. P. requirements"; pass.
P.S.-952	Tailby-Nason Co., Boston, Mass. *Nason's Palatable U. S. P. XI*	Below standard	0.85	0.82	156	183	608 units/teaspoonful vitamin D declared; low in vitamin D.
P.S.-963	Tailby-Nason Co., Boston, Mass. *Nason's*	O.K.	0.81	0.41	166	182	"Vitamin D in excess of minimum standard of U. S. P."; O.K.
P.S.-959	United-Rexall Drug Co., Boston, Mass. *Puretest*	O.K.	0.84	0.62	164	183	200 units/gm. vitamin D declared; O.K.
P.S.-961	Upjohn Co., Kalamazoo, Mich. *Super D*	O.K.	0.97	0.74	163	182	"Vitamin D in excess of U. S. P."; O.K.
P.S.-949	Whelco Products, Inc., New York, N. Y. *U. S. P.*	O.K.	0.82	0.46	167	181	85 units/gm. vitamin D declared; O.K.

content, although one other was passed. The number of samples in this lot is perhaps too small to draw any conclusion from this fact, but if further study of a larger number of samples showed that fish oils with low iodine numbers were consistently low in vitamin D, determinations of the iodine number could be used to sort out oils for the time-consuming vitamin D assay even if they could not be relied on as direct indications of the vitamin D contents.

P.S.-920. "Vita Baby Liquid Vit. Conc.", made by Grove Laboratories, Inc., St. Louis, Mo., was passed as to its claim of 8500 units of vitamin D per gram.

Saccharin Tablets

The U.S.P. requires that Soluble Saccharin Tablets shall contain not less than 95 nor more than 110 per cent of the labelled amounts of soluble saccharin. Of five samples submitted by the Dairy and Food Commissioner, two met these requirements or were reasonably close thereto; three did not:

No.	Manufacturer	*Soluble saccharin, grains/tablet* Declared	Found	Remarks
P.S.-938	Certified Drug & Chemical Co., New York, N. Y.	0.50	0.51	O.K.
P.S.-912	Knoll Chemical Co., New York, N. Y.	0.50	0.27	Too weak
P.S.-939	Knoll Chemical Co., New York, N. Y.	0.25	0.35	Too strong
P.S.-937	Sturman Co., New York, N. Y.	0.50	0.43	Pass
P.S.-936	Sturman Co., New York, N. Y.	0.25	0.19	Too weak

Miscellaneous Drugs

The following official samples of miscellaneous drugs were submitted by the Commissioner:

K.C.-482, 483 and 484. Analbis Suppositories. Specific Pharmaceuticals, Inc., New York, N. Y. This preparation was sold in adult's and child's sizes[1], but our samples were all the child's size. They were labelled "Each suppository contains 0.0675 Gm. bismuth salt of heptadienecarboxylic acid (0.0225 Gm. metallic Bi) in cocoa butter base". Three young children (27 months to 6 years old) died subsequent to administration of these suppositories for tonsillitis and a fourth was very ill but recovered. The suppositories were originally submitted to us with a request that they be tested for arsenic, because contamination with arsenic was suspected as the cause of the symptoms; no arsenic was found. At a later date pharmacological studies of these suppositories and pathological studies of autopsy specimens from the dead children were undertaken at the Yale University School of Medicine by Dr. William T. Salter and Dr. Roy N. Barnett. The cases have been reported by Dr. Barnett elsewhere[2]. Our part in this investigation was limited to analyzing one sample *(K.C.-484)* for bismuth and finding 0.0150 gm. per suppository as against 0.0225 gm. declared, and to establishing by means of the spectrograph the presence of a minute amount of bismuth (between 0.05 and 0.10 part per million) in the brain of one of the children (our No. *8413*) and a little more than 0.1 p.p.m. in the liver, 8333. Qualitative examination of the suppositories confirmed that the base was cocoa butter, and a few tenths of a cubic centimeter of a liquid fatty acid (presumably the "heptadienecarboxylic acid") were isolated but not identified.

The term "heptadienecarboxylic acid" is a general one for a group of compounds; consequently the declaration on the label did not specifically

1 *New Modern Drugs*, April 1946, p. 77.
2 *J. Am. Med. Assoc.*, 135, 28 (1947).

state just what bismuth salt was used. Later information revealed that the compound in the suppositories was the bismuth salt of diallylacetic acid. Without going into further discussion of the medical findings in these cases, there was apparent agreement among the physicians that the suppositories were at least a contributory factor to, if not the sole cause of, the children's deaths. However, not the bismuth, but the diallylacetic acid, was believed to be the toxic agent. Although in all of these cases the doses administered to the children exceeded those recommended on the label of the suppositories, the manufacturer of "Analbis" voluntarily removed this preparation from the market.

P.S.-924. Anexsia Tablets. S. E. Massengill Co., Bristol, Tenn.-Va. Analysis was as follows:

	Grains per tablet	
	Declared	*Found*
Codeine sulfate	0.50	0.46
Acetophenetidin	2.50	2.50
Acetylsalicylic acid (aspirin)	3.50	3.13
Caffeine	0.50	0.46

The sample was passed.

P.S.-907. Cold and Influenza Preventive. These tablets, manufactured in England, were claimed to be "a specific preventive for the common cold and influenza" and were said to be prepared by "isolating the chemical antibodies from normal beef serum". The sample consisted of six tablets, two each being colored red, white and black. Analysis showed that the main ingredients were sugar and talc; the amounts of protein as calculated from total nitrogen were respectively 1.00, 1.25 and 1.50 per cent for the red, white and black tablets.

Antibodies for influenza and possibly for the "common cold" do exist; they would not, however, be expected to be present in the blood of cattle that had not been inoculated with the mentioned diseases and, in any case, they would have to be administered by injection to be of any value. Eaten, they would only contribute a little protein to the diet.

P.S.-945 and 966. Dienestrol. White Laboratories, Inc., Newark, N. J. "Dienestrol" is a synthetic sex hormone. Its chemical name is 3,4-bis(p-hydroxyphenyl)-2,4-hexadiene. Unless labelled "for prescription use only", the container of this drug should have given dosage directions and warnings against unsafe use.

P.S.-911. D. K. Stabilizer. Drug Development Co., Hartford, Conn. This was a mouth wash containing sodium fluoride. Sample was submitted only for advice on whether it should be considered a new drug within the meaning of the law.

P.S.-923. Healing Salve. Aircraft Pharmacy, East Hartford, Conn. This salve was declared to contain 700 units of vitamin A, 70 units of vitamin D and 125 units of "vitamin F" per gram. On the basis of feeding tests on rats it was passed as to its vitamin D claim, but no "vitamin F" is recognized by competent authorities. This term was introduced for advertising purposes as a synonym for the essential unsaturated fatty acids, which are not "vitamins"; a claim for "vitamin F" is misleading and constitutes misbranding under the law.

P.S.-944. Mineral Oil. Jaivin's Drug Store, Hartford, Conn. The oil was mixed with water that may have come from using a wet bottle.

P.S.-916. Revo Tablets. Ormont Drug & Chemical Co., Inc., Long Island City, N. Y. Declared ingredients were "desiccated glands, orchic, prostate, suprarenal, thymus, and whole pituitary; desiccated beef arteries, beef heart, beef brain, and whole beef blood". There was also a statement, "Any therapeutic activity must be due to factors yet unknown to the present methods of assay", that was obviously placed on the label to evade action by regulatory authorities. Such a statement is tantamount to admitting that the product is worthless but, as the law does not prohibit the sale of worthless drugs but only prohibits false or misleading claims for their effectiveness, the sample was passed.

P.S.-922. Sulfadiazine Tablets U.S.P. American Pharmaceutical Co., New York, N. Y. Sulfadiazine per tablet: Declared, 0.5 gm.; found, 0.49 gm. O.K.

P.S.-921. Sulfathiazole Tablets U.S.P. American Pharmaceutical Co., New York, N. Y. Sulfathiazole per tablet: Declared, 0.5 gm.; found, 0.50 gm. O.K.

H.P.-100. Tablets Ergotrate Lilly. Eli Lilly & Co., Indianapolis, Ind. These tablets were declared to contain 1/320 grain (0.1 milligram) of ergonovine maleate. They passed U.S.P. XIII tests for identity and purity.

P.S.-861. Tincture Merbak. Schieffelin & Co., New York, N. Y. This preparation was labelled as containing one part in 1,000 of 2-acetoxymercuri-4-diisobutylphenol. As this compound contains 43.05 per cent of mercury, the tincture should contain 431 parts per million of mercury. We found 464 parts per million, and the sample was passed.

H.P.-102. Unknown medicine. This medicine was compounded by a physician for administration to his patient, and was examined at the request of the State Department of Health. The sample consisted of a small amount (6.5 cc.) of an orange-yellow liquid that analysis showed to be a syrup of chloral hydrate and potassium bromide.

Nine samples of miscellaneous drugs were submitted by a state hospital, a city board of health, a physician, a pharmacist and private individuals. Only four of these are of possible public interest:

1286. Capsules. These capsules, which were supplied on a refill of a prescription calling for 1/4 grain phenobarbital tablets, actually were 1.57 grain sodium seconal capsules. Aside from this error on the part of the pharmacist, a prescription for a barbiturate should not have been refilled without the specific direction of the physician.

8859. McKesson's Phenolphthalein Alba-Agar Laxative. McKesson & Robbins, Inc., Bridgeport, Conn. Phenolphthalein per fluid ounce: Declared, 6 grains; found, 6.05 grains.

9828. Unknown Lotion. This was a perfumed 1.29 per cent solution of mercuric chloride. A lotion containing so high a concentration of mercuric chloride is rather dangerous to use.

7514. Unknown Medicine. This was an aqueous decoction of senna containing 0.32 per cent alcohol.

Prescriptions

There was a detailed description of the reasons for undertaking the 1946 prescription survey and of the methods by which this survey was conducted in the 1946 Report[1]. Because analyses were completed during 1946 on only two of the eight prescriptions, results on Prescriptions 1 and 2 only were reported at that time. The other six prescriptions are reported herewith.

Prescription No. 3 was as follows:

Ammonii chloridi	10.0
Tinct. opii deodorati	4.0
Syrupi scillae	18.5
Extracti glycyrrnizae	4.0
Aquae q. s. ad	120.0

M. et sig. Dessertspoonful in water after meals and at bedtime.

Translated into ordinary English this prescription called for 4 grams of ammonium chloride, 4 cc. of laudanum, 18.5 cc. of syrup of squill and 4 grams of licorice made up to 120 cc. with water. The only ingredients that are determinable by ordinary chemical analysis are the ammonium chloride and the laudanum. Ammonium chloride was determined by distilling 2 cc. from magnesium oxide, collecting the evolved ammonia in standard acid and titrating. Laudanum, Deodorized Opium Tincture of the U.S.P., is standardized to contain between 0.95 and 1.05 grams of anhydrous morphine in each 100 cc. Since the prescription called for 4 cc. of laudanum in 120 cc., the samples should contain in 120 cc. four times the amount of morphine present in 1 cc. of laudanum, or between 0.038 and 0.042 gram. Fifty cc. samples were assayed by A.O.A.C. Method **39.97** for morphine in syrups.

Results of the analyses of the eight official samples are given in Table 12. Four samples were passed and four were deficient in some respect.

Prescription No. 4 was as follows:

Ammonii iodidi	4.0
Ammonii chloridi	8.0
Syrupi pruni virginianae	60.0
Aquae q. s. ad	120.0

M. et sig. A dessertspoonful in water after meals.

In English this prescription calls for 4 grams of ammonium iodide, 8 grams of ammonium chloride and 60 cc. of syrup of wild cherry made up to 120 cc. with water. Only the ammonium iodide and ammonium chloride are determinable by analysis. The methods we used were to determine total ammonia by distillation of 3 cc. samples, and iodide by a method worked out by Mr. Merwin of this laboratory, as follows:

> Two cc. of the sample were diluted with 75 cc. of water, 3 drops of 0.50% Rose Bengale solution were added, and the mixture was titrated with tenth-normal silver nitrate solution to a sharp bluish pink end-point. One cc. of the silver nitrate is equivalent to 0.01450 gram of ammonium iodide.

The calculated nitrogen equivalent to the ammonium iodide was subtracted from the total nitrogen and the balance calculated to ammonium chloride.

Results of the analyses of the seven samples of Prescription No. 4 are given in Table 13; three samples were passed and four were deficient. One sample, *K.F.-1099*, contained no ammonium iodide at all.

[1] *Conn. Agr. Expt. Sta., Bul.* 510, 48-50 (1947).

TABLE 12. ANALYSES OF PRESCRIPTION NO. 3
(Should contain 10 grams of ammonium chloride and 0.038—0.042 gram of morphine in 120 cc.)

D.C. No.	Pharmacy	Ammonium chloride, gm./120 cc.	Morphine, gm./120 cc.	Remarks
	Bridgeport			
K.C.-455	Golden's Pharmacy	9.25	0.037	Pass.
K.C.-456	Reed Drug Co.	8.71	0.051	Too weak in ammonium chloride; too strong in morphine.
K.C.-458	Siller Drug Store	7.70	0.036	Too weak in ammonium chloride.
	Hartford			
A.F.-984	Hoffman Drug Store	9.53	0.036	Pass.
A.F.-982	Jefferson Pharmacy	9.53	0.037	Pass.
	New Haven			
E.S.-1387	Hill Drug Store	9.62	0.030	Too weak in morphine.
	Stamford			
K.C.-429	Syl-May Drug Store	9.67	0.037	Pass.
	Westport			
K.C.-435	Dorain's Drug Store	9.30	0.066	Too strong in morphine.

TABLE 13. ANALYSES OF PRESCRIPTION NO. 4

(Should contain 4 grams of ammonium iodide and 8 grams of ammonium chloride in 120 cc.)

D.C. No.	Pharmacy	Ammonium iodide, gm./120 cc.	Ammonium chloride, gm./120 cc.	Remarks
	Bridgeport			
K.C.-445	Ethical Pharmacy	3.91	7.58	Pass.
K.C.-440	Golden's Drug Store	4.00	7.85	Pass.
K.C.-443	Lupe's Drug Store	3.48	6.73	Low in ammonium iodide and ammonium chloride.
K.C.-444	Pressman's Pharmacy	3.22	6.31	Low in ammonium iodide and ammonium chloride.
	Danbury			
K.F.-1099	Women's Drug Store	0.00	8.13	No ammonium iodide present.
	New Haven			
E.S.-1383	Norton Pharmacy	3.66	6.31	Low in ammonium chloride.
	Norwalk			
K.C.-438	Mead's Pharmacy	4.00	7.95	Pass.

Prescription No. 5 was as follows:

Hydrargyri chloridi corrosivi	0.13
Potasii iodidi	24.0
Syrupi sarsaparillae compositae	90.0
Aquae q. s. ad	240.0

M. et sig. One teaspoonful in water after meals.

In English this prescription calls for 0.13 gram of mercuric chloride and 24 grams of potassium iodide plus 90 cc. of compound syrup of sarsaparilla made up to 240 cc. with water.

This was a prescription that had been deleted from the original lot written by the State Department of Health physicians. By mistake an inspector did have one sample of Prescription No. 5 filled, and it was analyzed. Potassium iodide was determined by the same method as was used for ammonium iodide in Prescription No. 4 (one cc. of tenth normal silver nitrate is equivalent to 0.01660 gram of potassium iodide). The determination of such a small amount of mercury in the presence of so much organic matter proved to be difficult, but eventually the following method, which gave correct results with a sample of Prescription 5 compounded by us, was worked out:

Two cc. of the sample were mixed with 0.3 gm. of zinc dust and about 1.5 gm. of sodium hydroxide in a flask fitted with a cold finger condenser. The mixture was allowed to stand at room temperature for 45 minutes with occasional swirling and was then heated to simmering for 15 minutes more. It was filtered while warm through a thick asbestos pad on a Caldwell crucible and the residue washed thoroughly with alcohol, followed by several washings with water. The pad was returned to the original flask and treated with 10 cc. of water and 10 cc. concentrated nitric acid. After the reaction had subsided, the contents of the flask were boiled 5 minutes, then allowed to cool to 70° C. and treated drop by drop with 5% potassium permanganate solution until a strong pink color persisted. The mixture was then cooled to 20° C. and one drop of 3% hydrogen peroxide and then 75 cc. of water were added. Two cc. of 10% ferric alum solution were then added and the solution titrated with two-hundredths normal ammonium thiocyanate solution. One cc. of the ammonium thiocyanate solution is equivalent to 0.01358 gram of mercuric chloride.

The one official sample of Prescription No. 5, *A.F.-981*, obtained at the Capitol Pharmacy, Hartford, contained only 0.06 gm. of mercuric chloride in 240 cc. instead of the 0.13 gm. called for. It contained 23.90 gm. of potassium iodide in the same volume, the content of this ingredient, therefore, being very close to the 24 gm. called for.

Prescription No. 7 was as follows:

Zinc sulphatis		
Aluminis	aa	6.0
Glycerini		18.0

M. et sig. As directed.

This prescription calls for a mixture of 6 grams each of zinc sulphate and alum with 18 grams or cc. of glycerine. Because of the ambiguity in the directions as to whether a weight or measure of glycerine was called for, and because there are two official alums, namely, ammonium and potassium alum, the prescription does not define the percentages of its constituents with precision. Without going into our calculations in detail, it suffices to state here that any of the samples containing between 17.4 and 20 per cent each of zinc sulphate and alum were considered as exactly meeting the requirements of the prescription, while samples coming within 10 per cent of these requirements, i. e., containing between 15.7 and 22 per cent of each salt, were passed.

TABLE 14. ANALYSES OF PRESCRIPTION NO. 7

(Should contain between 17.4 and 20 per cent each of zinc sulphate and alum.)

D.C. No.	Pharmacy	Zinc sulphate, per cent	Alum, per cent	Remarks
	Bridgeport			
K.C.-451	Gerstl's Pharmacy	16.19	16.50	Pass.
K.C.-454	Greenspun's Pharmacy	17.03	0.00	Contained 19.89 per cent of metallic aluminum powder.
K.C.-441	Horvath Pharmacy	20.99	17.35	Pass.
K.C.-452	Toothill Pharmacy	17.96	17.47	O.K.
K.C.-453	Wood Avenue Pharmacy	16.72	15.63	Pass.
	Danbury			
K.F.-1102	Culhane Drug Store	13.35	22.42	Low in zinc sulphate and high in alum.
	New Haven			
E.S.-1408	Cedar Hill Pharmacy	26.53	17.90	Too strong in zinc sulphate.
	North Haven			
E.S.-1423	Leff's Broadway Pharmacy	18.33	15.24	Low in alum.

In all samples except one (which contained no alum at all) the alum actually present was the ammonium variety. Methods of analysis used were to determine zinc by the method of Hillebrand and Lundell[1] and calculate to zinc sulphate, and to determine ammonia by distillation of 5 cc. and calculate to the alum.

Results of analysis of the eight samples of Prescription No. 7 are given in Table 14. Four samples were passed and four were deficient. In one sample, *K.C.-454*, metallic aluminum powder was substituted for alum. When called before the Pharmacy Board for a hearing, the pharmacist making this substitution offered evidence that he had been accustomed to compounding external preparations containing aluminum powder both in the Army and for local physicians. Since the substitution of a single letter in the Latin of the prescription (a terminal "i" for an "s") would have made it call for "aluminum" instead of "alum", this mistake was not quite so ridiculous as it first appeared.

Prescription No. 8 was as follows:

Phenylis salicylatis	1.5
Tincturae opii camphoratae	15.0
Misturae cretae q. s. ad	90.0

M. et sig. Dessertspoonful every 3 hours.

In English this prescription calls for 1.5 grams of phenyl salicylate (salol) and 15 cc. of paregoric made up to 90 cc. with chalk mixture. Chalk mixture is a liquid containing 6 grams of prepared chalk plus a little saccharin, bentonite and cinnamon water in each 100 cc. Paregoric contains morphine, but in very small amount; it would not have been possible to determine the amount of morphine in a prescription like this without using much larger samples than were available. The samples were, therefore, analyzed only for phenyl salicylate and calcium carbonate (chalk). Without going into a detailed explanation of the necessary calculations, it may be stated that Prescription No. 8 should contain between 4.37 and 4.50 grams of calcium carbonate in each 90 cc.

Methods of analyses were as follows:

Phenyl salicylate: Five cc. were made just alkaline with sodium hydroxide, extracted immediately with chloroform and the chloroform just evaporated to dryness. The residue was then analyzed by A. O. A. C. Method **39.21(b)**.

Calcium carbonate: Two cc. were ashed and calcium determined in the ash by A. O. A. C. Method **12.12** and calculated to calcium carbonate.

There were three samples of Prescription No. 8; all were deficient in some constituent. Analyses are given in Table 15.

Prescription No. 9 was as follows:

Bismuthi subcarbonatis	16.0
Sodii bicarbonatis	12.5
Magnesii oxidi	6.0
Ft. chart. No. XX	

Sig. One powder in water half hour after meals.

This prescription called for a mixture of 16 grams of bismuth subcarbonate, 12.5 grams of sodium bicarbonate and 6 grams of magnesium oxide to be made into 20 powders. This is equivalent to the following percentages of the ingredients:

[1] *Applied Inorganic Analysis*, p. 331 (method b).

TABLE 15. ANALYSES OF PRESCRIPTION NO. 8

(Should contain 1.50 grams of phenyl salicylate and 4.37—4.50 grams of calcium carbonate in each 90 cc.)

D.C. No.	Pharmacy	Phenyl salicylate, gm./90 cc.	Calcium carbonate, gm./90 cc.	Remarks
	Hartford			
A.F.-985	Harris Pharmacy	1.18	3.71	Low in calcium carbonate.
	New Haven			
E.S.-1386	Orchard Pharmacy	0.25	4.43	Low in phenyl salicylate.
E.S.-1409	F. Edward McGuinness Pharmacy	0.58	4.55	Low in phenyl salicylate.

TABLE 16. ANALYSES OF PRESCRIPTION NO. 9

(Should contain 46.4 per cent bismuth subcarbonate, 36.2 per cent sodium bicarbonate and 17.4 per cent magnesium oxide.)

D.C. No.	Pharmacy	Bismuth subcarbonate, per cent	Sodium bicarbonate, per cent	Magnesium oxide, per cent	Remarks
	Bridgeport				
K.C.-448	Anthony's Drug Store	41.3	36.1	15.2	Low in bismuth subcarbonate.
K.C.-450	Capitol Drug Co.	45.6	36.1	14.8	Low in magnesium oxide.
K.C.-446	Dorman's Pharmacy	46.4	36.5	15.7	Pass.
K.C.-447	McKinley Pharmacy	43.3	40.0	14.8	High in sodium bicarbonate; low in magnesium oxide.
K.C.-449	Murray's Pharmacy	48.8	32.7	15.9	Pass.
	Danbury				
K.F.-1100	Lawson Drug Store	44.5	39.0	15.1	Pass.
	Hartford				
A.F.-988	Roma Pharmacy	44.7	37.1	17.5	Pass.
	New Haven				
E.S.-1388	Epstein's Pharmacy	47.3	35.0	13.2	Low in magnesium oxide.
E.S.-1382	Flexer's Pharmacy	40.2	37.1	14.8	Low in bismuth subcarbonate and magnesium oxide.

	Per cent
Bismuth subcarbonate	46.4
Sodium bicarbonate	36.2
Magnesium oxide	17.4

A complete examination of the samples of Prescription No. 9 would have called for weighing and analyzing each individual powder separately to ascertain both whether the mixture was properly prepared and whether it was divided into 20 powders of equal weight. Time did not permit of so thorough an examination; all powders in each sample were therefore mixed and the mixtures analyzed for the percentages of the ingredients. Methods of analysis were as follows:

Bismuth was determined by the oxychloride method[1], correcting for a 97.3 per cent yield obtained on mixtures of our own compounding.

Magnesium: One half gram sample was dissolved in 10 cc. of 1:1 hydrochloric acid, diluted to 200 cc., precipitated with hydrogen sulphide and filtered. The filtrate was evaporated to dryness and the residue taken up in 5 cc. of concentrated hydrochloric acid and made to a volume of 100 cc. An 80 cc. aliquot (equivalent to 0.40 gm. sample) was diluted with 20 cc. water and magnesium determined by A. O. A. C. Method **12.14.**

Sodium: Another 10 cc. aliquot of the solution above (equivalent to 0.05 gm. sample) was made slightly ammoniacal, evaporated to about 5 cc., cooled and treated by A. O. A. C. Method **12.21.**

Results of the analyses of the nine samples of Prescription No. 9 are given in Table 16. Because magnesium oxide of the U.S.P. need be only 96 per cent pure, samples containing as little as 16.7 per cent magnesium oxide were considered O. K., and those containing 15.0 per cent were passed. Four of the nine samples were passed and five were deficient.

Analytical Problems in the 1946 Prescription Survey[2]

R. T. MERWIN

The prescription survey undertaken in the fall of 1946, unlike our customary inspection of drugs under State laws, presented the Connecticut Agricultural Experiment Station with several analytical problems. In the past we had limited ourselves to analyzing the more commonly used drugs of the U. S. P. and the N. F. such as tincture of iodine, permanganate solutions and others easily prepared by the pharmacists. The 1946 survey, however, based as it was on eight prescriptions prepared by physicians of the State Board of Health, involved mixtures of three or more drugs. In all, there were 55 samples and the number of determinations was approximately 300, including duplicates and triplicates. It will be readily understood that considerable time was involved, but much of this time was taken up by the analytical problems encountered.

To assure accuracy in the assays we prepared our own prescriptions using official drugs and checked our proposed analytical methods against our laboratory standards. The methods, in general, were those of the A. O. A. C. or the U. S. P. In a few cases, because of analytical difficulties, we turned to other sources, making modifications where we found them necessary.

These analytical problems concerned chiefly the determination of mercury, of bismuth, of iodide in the presence of chloride, and of ephedrine sulfate in the presence of ethyl morphine.

[1] Scott and Furman, *Standard Methods of Chemical Analysis*, 5th ed., p. 153.
[2] Read at the Winter Meeting of the New England Association of Food and Drug Officials, Boston, Mass., February 25, 1948.

Some of the prescriptions were cough mixtures and, in addition to syrup extracts or other drugs, contained ammonium chloride. Some contained both ammonium chloride and ammonium iodide and one, not a cough mixture, had bichloride of mercury, potassium iodide and syrup of sarsaparilla. Where ammonium chloride occurred singly, ammonia was easily determined by distillation.

In assaying prescriptions containing both iodides and chlorides, our first thought was that we could obtain ammonia by distillation and iodide by the Clark and Jones Method in the J. A. O. A. C., Vol. XXV, 1942, 757. This method was developed principally to determine iodine in potassium iodide and various kinds of organic compounds by fusion with sodium carbonate and subsequent titration of liberated iodine. But all our recoveries were low through loss of iodine during fusion. The possibility of titrating the iodide in the presence of chloride by use of an adsorption indicator was considered. Such a method is described by Kolthoff and Sandell in their "Textbook of Quantitative Inorganic Analysis", 1945 edition, page 572.

The method depends on the direct titration of iodide with silver nitrate and the adsorption of the indicator ions on the silver iodide at the titration end-point before the chloride begins to precipitate. Kolthoff and Sandell suggest di-iodofluorescein or Bengal Red as indicators; we used Rose Bengal, which is an alkali salt of tetraiododichlorofluorescein. We found that Rose Bengal gave a sharper, more pronounced end-point than di-iodofluorescein—a change from deep pink to lavender—and also a theoretical end-point. The color change with di-iodofluorescein is from orange to bluish-red. The change is not very sharp, more indicator is required, and, furthermore, it is an indicator that leads too readily to over-titration so that a correction must be applied to yield theoretical results.

Therefore, a 0.5 per cent solution of Rose Bengal was used and the iodide titrated directly in the presence of chloride. Two cc. of the sample were diluted with 75 cc. of water and 3 drops of indicator added. The silver nitrate was run in slowly to the end-point. It was fortunate that there were no interfering ingredients in the prescriptions thus assayed. Our experience indicates that simple cough mixtures containing iodides and chlorides can readily be assayed by this method even though syrup extracts are present, if they are sufficiently diluted before titration. In the presence of bromides, hypophosphites, ferrous salts, possibly creosote and certain other incompatibles, reliable results might not be obtained.

The prescription which contained mercuric chloride, potassium iodide and compound syrup of sarsaparilla was assayed for its iodide content in the same way. Results were within 0.04 per cent of theoretical.

In assaying for mercury in this prescription, we encountered another analytical difficulty. Among several procedures considered for the determination of mercury, the method of Rotondaro proposed in the Journal of the American Pharmaceutical Association, Vol. 33, 1944, page 353, looked promising. This method is for the assay of mercury in pharmaceutical preparations and is a modification of the method of Rauscher published in the Analytical Edition of Industrial and Engineering Chemistry, Vol. 10, 1938, page 331. It is based on the fact that ethanolamine reduces mercury to the metallic state. Rotondaro's contribution is the use of powdered zinc and ammonium hydroxide or sodium hydroxide for amalgamation of the two metals. The zinc amalgam is then separated from the solution by filtration through asbestos in

a Caldwell crucible, dissolved in 1 to 1 nitric acid, treated with permanganate, the excess permanganate removed with hydrogen peroxide, and the mercuric nitrate titrated with ammonium thiocyanate. Rotondaro's method calls for a minimum boiling time of five minutes for complete reduction of most inorganic mercury salts. He uses a mixture of two volumes of ethanolamine, two volumes of xylene or toluene and one volume of butyl alcohol. Ten cc. of this mixture is placed in a flask having a cold-finger condenser with about 0.3 gram of powdered zinc and 2 to 3 cc. of strong ammonia. The sample, calculated to yield 2 to 50 milligrams of mercury, is added and the contents of the flask boiled from 5 to 15 minutes.

We attempted to assay Prescription No. 5 by this method but, since it contained mercury as the bichloride, we did not immediately apply heat but, instead, waited until reduction had started before using the flame. However, we could not obtain reliable and concordant results. All recoveries were low. Therefore, several modifications were tried, including the use of sodium hydroxide in place of ammonium hydroxide and the substitution of triethanolamine for ethanolamine, but all these procedures gave low yields. No doubt greater experience with the method would have given satisfactory results and it is not our intention to imply that Rotondaro's method is not all that its author indicates.

However, we finally worked out a method that gave consistent and theoretical results on our standard prescription and adopted it for assaying our unknown. We omitted the ethanolamine and organic solvents because it was apparent that the organic amine required heating with mercurials to effect reduction. We also felt that solid pellets of sodium hydroxide instead of its solution would accelerate reduction by tending to keep the solution volume low. Powdered zinc was retained to act with the sodium hydroxide to release hydrogen. We used 10 cc. samples diluted with an equal volume of water. Total volume was kept to about 20 cc. and no preliminary heating was found necessary to start reduction of the mercury.

In fact, the alkali-zinc mixture easily reduced the mercury in the cold, and gentle boiling was applied only after complete amalgamation had taken place. To prevent possible loss of mercury as the chloride, the contents of the flask were allowed to simmer only after standing 45 minutes. The mossy zinc amalgam was easily filtered while the solution was warm upon a thick asbestos pad in a Caldwell crucible, and the flask and amalgam washed with 95 per cent alcohol, followed by several washings of water. The pad with the amalgam was then transferred to the reduction flask, the mercury dissolved in 1 to 1 nitric acid, the solution boiled after reaction had subsided, and the mercuric nitrate titrated in the same flask in the usual way with ferric alum indicator and ammonium thiocyanate. The titration was essentially the same as the U. S. P. XIII method for assay of ammoniated mercury.

Prescription No. 5 and our standard prescription each theoretically contained 399 p.p.m. of mercury and our results were consistently 393 p.p.m. or 98.4 per cent recovery.

At the time of these mercury assays we had in the laboratory a sample of "Merbak", which is a 1:1,000 tincture of an organic mercurial. Specifically, it is 2-acetoxymercuri-4-diisobutylphenol. Several assays of this sample by the alkali-zinc reduction method yielded consistently 310 p.p.m. of mercury as against a theoretical mercury content of 431 p.p.m.

An alternative method for mercury, generally known as the Hubbard

method, was also tried on the prescription containing the bichloride. It appears in the Analytical Edition of Industrial and Engineering Chemistry, Vol. 12, 1940, page 768, and was developed for mercury in urine. Essentially, it consists of destroying organic matter by a sulfuric acid-permanganate digestion, shaking out an aliquot of the mercury solution with di-betanaphthylthiocarbazone in chloroform solution, and determining the red color colorimetrically. This method when applied to our standard prescription proved disappointing because much of the mercury was lost during digestion. However, later, in assaying Merbak by the same method, we did obtain good results.

Our last prescription presented us with one final problem. The prescription contained bismuth subcarbonate, sodium bicarbonate and magnesium oxide. A simple precipitation of the bismuth with hydrogen sulfide seemed a natural procedure and it was tried. We observed the usual precautions as to correct precipitation acidity and the necessary washings with alcohol, ether and carbon disulfide, but could not obtain reliable results. Therefore, we turned to another precipitation method. It is well known and is based on the fact that, when a hydrochloric acid solution of bismuth is diluted with water under the proper conditions, an insoluble precipitate of bismuth oxychloride forms. The method gave us consistent recoveries of 97.3 per cent on our standard prescription and we used this basis for all our calculations on unknowns.

Before concluding, mention might be made of an interesting observation in connection with our assay of a prescription containing ammonium chloride 50 grains, ephedrine sulfate 3 grains, and enough syrup of cocillana to make 4 oz. We used Parke-Davis's "Cosanyl" as syrup of cocillana in preparing our standard prescription. This contains 1/4 grain of ethyl morphine hydrochloride per fluid ounce, and the question was whether or not it would be extracted with the ephedrine.

The proportion of alkaloids in the prescription is 3 grains of ephedrine sulfate to 1 grain of ethyl morphine hydrochloride. If some of the opium alkaloid were extracted and titrated, it would introduce an appreciable error. However, assay of our standard for ephedrine by extraction with ether, which is a poor solvent for opium alkaloids, gave us a recovery of 2.97 grains or 99 per cent. If all the ethyl morphine were extracted and titrated, our yield, calculated as ephedrine sulfate, would be 3.56 grains. Even a partial extraction of the opium alkaloid with complete extraction of ephedrine would give more than 2.97 grains.

There may, of course, have been an incomplete extraction of both alkaloids with such a compensation of errors as to result in a yield very close to the theoretical. However, if such were the case, it would be an extraordinary coincidence.

As a matter of fact, feed and drug analysts dislike coincidences that are unexplained. If such coincidences recur again and again under the same conditions, they stop calling them coincidences. When such an extraordinary thing takes place, being only human, they sigh with relief and exclaim "Thank goodness! That's one more analytical problem solved".

COSMETICS

Thirteen official samples of cosmetics were examined as follows:

H.P.-105. Benex Brushless Shave. Bristol-Meyers Co., New York, N. Y. The tube only half filled the carton.

P.S.-960. Conti Shampoo. This was supposed to be straight Castile soap. Analysis was as follows: Soap, 93.72; free fatty acids, 1.41; insoluble matter, 0.28; moisture, 3.20, and undetermined, 1.39 per cent.

H.P.-107. Gillette Lather Shaving Cream. Gillette Safety Razor Co., Boston, Mass. The carton was only 40 per cent filled by the tube.

H.P.-109. Hair Tonic. This sample was submitted only for criticism of the proposed labeling.

P.S.-943. Hair Tonic. Sample was a suspension of sulphur in a perfumed dilute alcohol solution of oil of cloves (or eugenol).

P.S.-918. Kleen Ezy Laundry Soap. Carolina Products Co., Salisbury, N. C. This sample was submitted because of a complaint that its use caused irritation to the skin. No free caustic was found. It was "perfumed" with pine tar and colored with a yellow dye, probably metanil yellow.

P.S.-913. Kongolene Hair Straightener. Kongo Chemical Co., Inc., New York, N. Y. This was a fatty preparation containing 3.08 per cent of sodium hydroxide and 0.75 per cent of sodium carbonate.

P.S.-940. Lustre-Creme Shampoo with Lanolin. Kay Daumit, Chicago, Ill. This was a sodium soap-lanolin mixture. It contained no free caustic.

P.S.-915. New York Master Hair Straightener. J. J. Graves, Jersey City, N. J. This was a fatty preparation containing 6.12 per cent of sodium hydroxide and 5.32 per cent of sodium carbonate. It contained much more free caustic than the other two hair straighteners which were examined and was, consequently, more dangerous. In fact, the label stated "We disclaim all liability", so the manufacturer himself apparently was afraid of what his product might do; however, in the lack of any certain evidence as to how much caustic should be permitted in products of this class, the sample was passed.

P.S.-914. Posner's Hair Straightener. I. Posner, Inc., New York, N. Y. This sample contained 2.28 per cent of sodium hydroxide and 0.63 per cent of sodium carbonate in a fatty base perfumed with oil of sassafras.

P.S.-909. Safe Wave Permanent. Raymond Lab., Inc., St. Paul, Minn. This was a perfumed pink aqueous solution with a green fluorescence. Analysis was as follows: Sodium thioglycollate, 4.86; synthetic wetting agent, 3.85; and ammonia (NH_3), 0.51 per cent. It was colored with a dye related to eosine.

H.P.-106. 12 O'Clock Rub. This sample contained 64.4 per cent of isopropyl alcohol.

P.S.-917. Ultra Violet Revlon Nail Polish. Revlon, New York, N. Y. This polish consisted of a nitrocellulose lacquer with camphor as a plasticizer dissolved in a mixture of ethyl and amyl acetates and containing a pigment that was a mixture of titanium dioxide with at least two unidentified dyes.

Two unofficial samples of cosmetics were examined, one for the New Haven Health Department and one at the request of the Dairy and Food Commission:

8217. Old Empire Cream Deodorant. Fuller Brush Co., Hartford, Conn. Analysis was as follows: Hexamethylenetetramine, 5.53; water and perfume, 79.32; fat, 14.99, and mineral matter, 0.16 per cent.

9886. Signet de luxe Creme Cold Wave Standard. Acme Cosmetic Co., Chicago, Ill. This sample consisted of a 4 ounce bottle of a milky pink liquid and a small envelope, labelled "fixative", of a white powder. The liquid was an aqueous solution containing 7.31 per cent ot ammonium thioglycollate and 0.49 per cent of free ammonia, together with a synthetic wetting agent. The powder, which was to be mixed with hydrogen peroxide solution before use, was a similar wetting agent.

COLLABORATION WITH OTHER DEPARTMENTS

Five hundred and sixty-two samples, not included in other reports from this laboratory, were analyzed for other Federal, State and Station departments. Many of the analyses were made spectrographically. Distribution was as follows:

	Samples
U. S. Food and Drug Administration	17
U. S. Geological Survey (water)	47
State Board of Fisheries and Game	1
State Department of Health (narcotics)	11
State Police	9
Station departments:	
Biochemistry	13
Botany	181
Entomology	98
Forestry	69
Genetics	13
Soils	72
Tobacco Laboratory	31
	562

BABCOCK GLASSWARE, ETC.

As required by Sections 3191 and 3240 of the General Statutes, milk and cream test bottles and milk pipettes, and check thermometers used in milk pasteurizing plants, have been examined as follows:

	Pieces	*Incomplete or inaccurate*
Babcock glassware	2,663	11
Thermometers	268	20
	2,931	31

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