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THE FIFTIETH REPORT ON

FOOD PRODUCTS

AND THE THIRTY-EIGHTH REPORT ON

DRUG PRODUCTS

1945

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Agricultural Experiment Station
New Haven

CONTENTS AND SUMMARY

Material	Page	From		Total	Adulterated, mis-branded or otherwise questionable
		Dairy and Food Commissioner	Other Sources		
FOODS					
Baked products	4	7	1	8	5
Beverages, carbonated, etc.	5	262	3	265	26
Cereals	5	...	2	2	...
Coffee	7	1	1	2	...
Confectionery	7	7	...	7	2
Contaminated or decomposed foods	7	128	37	165	78
Deceptive packaging	8	43	...	43	22
Eggs	9	1	...	1	...
Extracts and flavors	9	7	...	7	3
Fats and oils:					
Butter	10	5	1	6	...
Olive oil, etc.	10	33	5	38	14
Fruit juices	10	13	1	14	2
Gum	12	8	...	8	3
Honey	12	1	9	10	...
Meat and meat products	13	32	7	39	8
Milk and milk products:	19	57	76	37	
Fluid milk and cream	14	...	5	5	...
Condensed milk	15	...	...	...	...
Vitamin D milk	15	104	...	104	6
Popcorn and potato chips	15	51	...	51	37
Preservatives	18	3	...	3	...
Preserves	18	1	...	1	...
Salad dressings and mayonnaise	18	29	...	29	11
Sardines and anchovies	20	80	...	80	9
Sauerkraut	27	8	...	8	6
Spaghetti and spaghetti sauce	29	11	...	11	3
Spices	29	3	...	3	...
Spray residues	29	105	5	110	4
Sweet potatoes	30	9	...	9	9
Syrups	30	15	3	18	3
Vinegar	30	...	1	1	...
Miscellaneous	31	33	27	60	16
Totals		1,019	164	1,183	304
DRUGS					
Ascorbic acid tablets	32	13	...	13	...
Boric acid solution	32	20	...	20	7
Diluted hydrochloric acid	33	24	...	24	4
Mild tincture of iodine	33	18	...	18	6
Nicotinamide tablets	35	3	...	3	...
Potassium permanganate solution	35	19	...	19	4
Saccharin tablets	35	15	...	15	3
Solution of potassium arsenite	36	21	...	21	3
Solution of potassium iodide	37	29	...	29	7
Syrup	37	17	...	17	10
Miscellaneous drugs	37	20	9	29	3
Totals		199	9	208	47
Cosmetics	39	7	8	15	2
Collaborative	41	...	397	397	...
Total for all		1,225	578	1,803	353
Babcock glassware, etc.	41	...	1,373	1,373	21

THE FIFTIETH REPORT ON
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H. J. FISHER

This report summarizes examinations of official samples of foods, drugs and cosmetics submitted by the Dairy and Food Commissioner during the calendar year 1945. Included are examinations of materials submitted by health officers and others, and also analytical work done as a service to other State and Station departments.

Edward Monroe Bailey retired as chemist in charge of the department on October 1, 1945, after 43 years of service. He first came to work for the Station in July 1902; in 1918 he was appointed acting head of the department in the absence of J. P. Street, then on military service; in 1919 Mr. Street resigned and Dr. Bailey became chemist in charge, retaining this post for the ensuing 26 years. His reputation as an authority on the composition of foods and drugs was recognized during this period by his appointment to such bodies as the Food Standards Committee of the U. S. Department of Agriculture and the Councils on Foods and on Pharmacy and Chemistry of the American Medical Association. He followed in the steps of Johnson, Jenkins, Winton and Street of this Station in serving as president of the Association of Official Agricultural Chemists, and was in charge of two revisions of its book of methods. He also served as president of the Association of American Feed Control Officials. The tables of composition of foods published in various editions of Joslin's "Treatment of Diabetes Mellitus" have been largely the result of analyses made at this Station under his direction.

Clarence E. Shepard also retired on October 1 after 35 years of service. His expert knowledge of poisonous plants and of toxicological analysis and the accuracy, thoroughness and dependability of all his work make his retirement a distinct loss to the Station.

The present writer saw the completion of his work as chairman of the Revision Committee for the 6th edition of the A.O.A.C. "Methods of Analysis" with the publication of this book early in 1946.

A spectrograph was purchased and finally completely installed late in 1945. W. T. Mathis was placed in charge of its operation. The use of this instrument for accurate quantitative analysis has not been so thoroughly explored in the agricultural field as it has been in metallurgy, but we have already found that pasture grasses and tobaccos can be analyzed simultaneously for several elements by means of the spectrograph with as great accuracy as by chemical means and in a fraction of the time. The spectrograph has also proved very useful in our examinations for poisons.

Fourteen hundred and six samples of foods, drugs, cosmetics and related materials have been examined during the year. Service to other State and Station departments has involved analyses of 397 additional samples. A total of 1,373 pieces of Babcock glassware, etc., has been checked for accuracy.

The loyal and effective cooperation of the department staff both with Dr. Bailey and with the present writer is gratefully acknowledged. Without such cooperation, the change of direction could not possibly have been made so smoothly.

FOODS

BAKED PRODUCTS

Seven samples of baked products were submitted by the Dairy and Food Commissioner, and one sample of whole wheat bread was analyzed for the baker. Five were adulterated or misbranded.

Four of these samples were "Skokie Farms Ice Box Cookies", manufactured by Skokie Valley, Skokie, Ill. The declared list of ingredients included "U. S. P. mineral oil". Mineral oil was identified in the cookies, in amounts ranging from 0.66 to 1.02 per cent. Mineral oil is not a proper constituent of any foodstuff.

In one sample, S.-776, "Tem-Tees", made by Rosenwasser Baking Co., Brooklyn, N. Y., no sugar was declared in the list of ingredients, but 17.75 per cent of sucrose (cane sugar) was found on analysis.

The other two samples from the Dairy and Food Commissioner were a sample of cookies, which contained no mineral oil, and a rum and brandy fruit cake, which probably contained very little rum or brandy but was passed.

Analysis of the whole wheat bread, 2347, yielded the following figures on the basis of the fresh bread: moisture, 39.91; ash, 2.02; protein, 10.26; fiber, 1.05; carbohydrate other than fiber, 46.01, and fat, 0.75 per cent.

CARBONATED BEVERAGES, etc.

Alcohol was determined in three samples of ale submitted by a purchaser. The amount varied between 5.18 and 7.45 per cent. One sample of beer, K.F.-586, was examined for foreign matter and none was found.

Two hundred and forty-nine samples of carbonated beverages of the "soda" type were examined for the Dairy and Food Commissioner. Twenty-four were adulterated or misbranded, of which 13 contained saccharin and were low in sugar, three contained saccharin but contained more than 5 per cent of sugar, four were deficient in sugar but contained no saccharin, and four contained artificial color that was not declared. The use of saccharin in non-alcoholic beverages is specifically prohibited by statute; the same law also requires that beverages other than cereal beverages, cider or spring or mineral water contain not less than 5 per cent of sugar.

Approximate sugar content (solids by refraction) was determined in 247 samples. One sample, W.-642, Canada Dry Water, contained no sugar. Excluding the 16 samples containing saccharin, the minimum sugar content was 3.4 per cent and the maximum was 15.4 per cent. Thirty-three contained less than 8 per cent of sugar; 41 between 8 and 9 per cent; 43 between 9 and 10 per cent; 44 between 10 and 11 per cent; 46 between 11 and 12 per cent, and 23 contained more than 12 per cent.

Two samples of "Palm Beach" orangeade, K.F.-655 and 656, contained ash equivalent to only 9.8 per cent of orange juice. Orangeade should contain at least 15 per cent of orange juice.

Ten samples of miscellaneous beverages and beverage bases were examined for saccharin. None was found.

Adulterated and misbranded samples are listed in Table 1.

CEREALS

2183, 3136. *Haig's Wheat*. George Haig, New Haven, Conn. This product was stated to be the whole wheat grain that had undergone no processing except cleaning. Analyses of the two samples as compared with the mean values for domestic wheat¹ were as follows:

	2183	3136	Domestic wheat
Moisture	9.68	10.82	10.62
Ash	1.67	2.48	1.82
Protein	11.13	9.31	12.23
Fiber	1.12	1.34	2.36
Carbohydrate other than fiber	75.64	74.75	71.18
Fat	1.06	1.30	1.77

¹ Leach and Winton. *Food Inspection and Analysis*, 4th. Ed., p. 281.

TABLE 1. ADULTERATED OR MISBRANDED SODA TYPE BEVERAGES

D. C. No.	Dealer and type of soda	Solids (Approximate sugar content)	Remarks
G. S.-442	Ansonia Ansonia Bottling Works. Orange soda	7.49	Artificial color present, not declared.
E. S.-842	New Haven Eli's Food Shop. Orange soda	11.95	Artificial color present, not declared.
K. F.-513	Stamford National Spring Water Co. Sarsaparilla	3.21	Contained saccharin; deficient in sugar.
K. F.-514	" " " Root beer	3.53	Contained saccharin; deficient in sugar.
K. F.-515	" " " Orange soda	4.38	Contained saccharin; deficient in sugar.
K. F.-548	" " " Orange soda	3.46	Contained saccharin; deficient in sugar.
K. F.-549	" " " Orange soda	3.46	Contained saccharin; deficient in sugar.
K. F.-550	" " " Ginger ale	4.50	Deficient in sugar.
K. F.-551	" " " Ginger ale	4.33	Deficient in sugar.
K. F.-552	" " " Lemon and lime soda	3.43	Contained saccharin; deficient in sugar.
K. F.-553	" " " Lemon and lime soda	3.41	Contained saccharin; deficient in sugar.
K. F.-554	" " " Sarsaparilla	3.56	Contained saccharin; deficient in sugar.
K. F.-555	" " " Sarsaparilla	3.52	Contained saccharin; deficient in sugar.
K. F.-556	" " " Root beer	3.73	Contained saccharin; deficient in sugar.
K. F.-557	" " " Root beer	3.59	Contained saccharin; deficient in sugar.
K. F.-558	" " " Grape soda	3.54	Deficient in sugar.
K. F.-559	" " " Grape soda	3.41	Deficient in sugar.
K. F.-560	" " " Cream soda	3.33	Contained saccharin; deficient in sugar.
K. F.-561	" " " Cream soda	3.24	Contained saccharin; deficient in sugar.
G. S.-428	Waterbury X-tra Bottling Co. Orange soda	10.62	Artificial color present, not declared.
E. S.-807	West Haven Atlantic Bottling Works. Cream soda	5.07	Contained saccharin.
E. S.-808	" " " Orange soda	9.53	Contained saccharin.
E. S.-820	Barry's Stand. Cream soda	8.11	Contained saccharin.
E. S.-865	Spiegel Bros. Bottling Co. Orange soda	8.83	Artificial color present, not declared.

COFFEE

One official sample of coffee and one sample submitted by the Mansfield State Training School were examined for the presence of chicory or other adulterants. Both appeared to be genuine coffee.

CONFECTIONERY

Seven official samples of confectionery were submitted by the Dairy and Food Commissioner. Four of these were examined for saccharin. Three contained none; in one, E.S.-1015, "Co-Co Mins", packed by Vital Foods Corp., Evanston, Ill., saccharin was present and declared. Saccharin is not a permitted ingredient in foods for general use even when declared.

E. S.-834. Lister's Brittle. Lister Bros., Inc., New York. This candy was labelled: "This sugar-free imitation candy tends to satisfy the craving for sweets of those persons who for one reason or another cannot have ordinary candy. To be taken as physician may direct". Both saccharin and dulcin were declared; the presence of dulcin was confirmed. Dulcin is a non-nutritive synthetic sweetening substance, the use of which would not be permitted in foods for general use, but because this candy was labelled as a food for special diet purposes it was passed.

E.S.-992. Holloway Ko-Ko-Mo. M. J. Holloway & Co., Chicago. These lollipops were claimed to contain 8 per cent butter fat. The total fat content found was 3.00 per cent; this fat had a Reichert-Meissl value of 5.8, indicating that the lollipops contained not more than 0.57 per cent of butter fat.

E.S.-1023. "Syros" Confectionery. C. A. Paleos Co., Lowell, Mass. The pieces of this Turkish paste had a heavy white powdery coating that was found to be cornstarch.

CONTAMINATED OR DECOMPOSED FOODS

Foods may be contaminated by contact or admixture with foreign materials that may or may not be poisonous or impart unpleasant flavors. Examples of such contamination are the accidental mixing of sodium fluoride with flour and the absorption by butter of odors from foods stored with it. The most common form of contamination encountered in food inspection is, however, the presence of such filthy materials as rodent excreta and insects. Rodent excreta are definitely a health hazard; the presence of insects in a food may not make the food unsafe, but such a food is repulsive. Decomposed food is food that has undergone such changes, for whatever cause, that it is no longer fit for consumption. Under the law a food is adulterated "if it shall consist in whole or in part of any diseased, contaminated, filthy, putrid or decomposed substance or if it shall be otherwise unfit for food".

One hundred and twenty-eight official samples were examined for evidence of filth, contamination or decomposition. Of these, 57 were passed and 67 were definitely unfit for food or were of doubtful fitness. More flour was examined than any other food: Of 62 samples of flour, 45 contained either insects or rodent excreta or both. One sample, F.-609, contained a whole mouse. Other materials included bread and bread dough (10 samples, two adulterated), carbonated beverages (six samples, three adulterated), candy (10 samples, four adulterated), corn meal (five samples, all insect-infested), raisins (five samples, four insect-infested), macaroni and egg noodles, infant foods, nuts, frankfurts, sausages and canned Lupini beans. One sample of ale, K.F.-664, contained a cigarette butt.

Three samples of granulated sugar, E.S.-796, 797 and 798, were submitted by the Commissioner on complaint that they had made people sick. The sugars had a light pink color and contained between 1.74 and 2.64 per cent of lead arsenate. A teaspoonful of these sugars would contain between one-ninth and one-fourth of a fatal dose. Where the contamination of the sugar with the lead arsenate took place we do not know.

Thirty-seven samples of miscellaneous foods suspected of being contaminated or decomposed were examined for State and local health departments and for individuals. Twenty-eight were passed.

One sample of flour, 2628, contained mouse excreta; a cereal, 4313, was insect-infested; one sample of crullers, 3851, contained fragments of glass; a piece of pie, 3778, contained sodium fluoride and a green dye; a jar of ripe olives, 3619, contained a rusty screw; and a sample of canned beets, 2260, was found decomposed. One sample, 4664, submitted by the New Britain City Health Department, consisted of worms that were infesting fish in a public market. These worms were identified by Dr. Thompson of Yale University as ascarids.

DECEPTIVE PACKAGING

A food is misbranded "if its container shall be so made, formed or filled as to be misleading". Manufacturers have noted that, of two packages of the same kind of food, sold at nearly the same price, the consumer will usually choose the larger size package, regardless of whether there is any difference in the net weights of the contents. This tendency offers a temptation to the unscrupulous manufacturer to pack his goods in large containers that are only partly filled. Such a practice is obviously deceptive, and the law so regards it. Particularly flagrant cases of slack filling have been the special packages of candies put out for the Christmas and Easter trades. Many of these packages consist of elaborate containers, sold at high prices, that contain very little candy.

In judging whether a package is "so made, formed or filled as to be misleading" under the law, the guiding principle in each case

must be whether the package would actually be deceptive to the average purchaser using reasonable care. A product in a cellophane wrapper that leaves the contents readily visible is not deceptively packed even though the package is slack filled; the same product in a cardboard carton of the same size would be misbranded.

Forty-three official samples were examined. Of these 20 were macaroni or spaghetti, six of which were deceptively packed; eight were potato chips (six deceptively packed); four were "Wheaties", whose cartons were only 65 per cent filled; six were candies (three deceptively packed) and five were miscellaneous products (three deceptively packed). Of the total number, 22 were misbranded because of deceptive packing.

EGGS

One official sample of eggs, E.S.-908, was examined on suspicion that the eggs were cold storage eggs. The ammonia nitrogen, 2.9 mg./100 gm., the large air spaces and watery whites, indicated that the eggs were just on the borderline of edibility, but did not show that they were cold storage eggs.

EXTRACTS AND FLAVORS

Seven official samples were examined for the Dairy and Food Commissioner. Three were improperly labelled:

N.-672, Genuine Strega Flavor; N.-673, Genuine Verdolino Flavor; both manufactured by Columbo Extract Co., Brooklyn, N. Y. The ingredients were not declared.

K.F.-469, Dairy Type Butter Flavor. The Lusterine Mfg. Co., Bridgeport, Conn. This preparation was rancid and its label did not declare the ingredients. It should have been labelled "Imitation Butter Flavor".

Four samples were passed:

E.S.-661, Gold'N Brand Imitation Butter Oil. Gold'N Oils, Inc., Boston, Mass. This sample declared cottonseed oil, certified color and artificial flavor, and examination verified the declared composition.

N.-629, Holler's Imitation Lemon Flavor. Holler's, Miami, Fla. This sample was tested for saccharin and none found.

N.-630, Holler's Imitation Cherry Flavor. Holler's, Miami, Fla. Examination of the coal tar color in this preparation showed that it was a mixture of two permitted dyes, amaranth and Ponceau 3R.

E.S.-563, High Life Brand Pure Vanilla Extract. Holsum Products, Brooklyn, N. Y. Analysis was as follows: Vanillin, 0.21; total ash, 0.236; soluble ash, 0.204, and insoluble ash, 0.032 gram per 100 cc; Winton lead no. 0.37; total acidity, acidity due to vanillin and non-vanillin acidity, equivalent to 27, 14 and 13 cc, respectively, of

tenth-normal alkali per 100 cc; alkalinity of total, soluble and insoluble ash equivalent to 39, 28 and 11 cc, respectively, of tenth-normal acid; percentage of color insoluble in amyl alcohol, 15.2; coumarin and caramel not present.

FATS AND OILS

Butter

Five official samples of butter were submitted by the Dairy and Food Commissioner, and one sample was examined for the New Haven City Health Department. All appeared to be genuine butter.

Olive Oil, etc.

Thirty-three official samples of salad oils and cooking fats were examined, of which 11 were adulterated or misbranded. Of four samples of supposed olive oil submitted by purchasers, only one was genuine olive oil. One sample submitted by the Waterbury Health Department was also olive oil.

Sixteen official samples appeared to be pure olive oil and were otherwise unobjectionable. One sample each of corn oil, linseed oil, imitation olive oil and an olive-infused corn oil, were passed. Two hydrogenated vegetable fats, E.S.-646, "Nut-Ola", and E.S.-955, "Cirol", were also passed.

The adulterated and misbranded official samples are listed in Table 2.

FRUIT JUICES

Thirteen official samples were submitted by the Dairy and Food Commissioner. Ten were passed, two were adulterated and one was not examined.

Three samples of orange juice were passed. Analyses of an orange juice concentrate, W.-615, "Sunfilled Brand Pure Concentrated Orange Juice", packed by Citrus Concentrates, Inc., Dunedin, Fla.; of a dilution of this, W.-614, stated to be with 7 parts of water; and of a dilution of W.-615 with 7 parts of tap water made in our laboratory, 3045, were as follows:

	W.-615	W.-614	3045
Ash, per cent	2.39	0.428	0.424
Ascorbic acid, mg./gm.	2.12	0.32	0.35

Two samples of grapefruit juice, two of prune juice and one of lemon juice, examined for miscellaneous reasons, were passed.

One sample of "Concord Grape Juice Punch", claimed to contain vitamin B₁, was not examined. Extended analyses were made of two samples of "Paradise Brand Pure Concord Grape Juice", packed by Paradise Packing Co., Brooklyn, N. Y. Results, expressed as grams per 100 cc, were as follows:

TABLE 2. ADULTERATED AND MISBRANDED SALAD OILS

D. C. No.	Dealer and brand	Remarks
K. F.-376	Bridgeport J. De'Angello. <i>La Rosa Oil</i>	Corn, peanut and olive oils declared. Oil mostly corn oil with some peanut oil, probably no olive oil; coal tar dye present not declared; short volume 4 fl. oz. in 1 gallon. Sample was mineral oil. Contained cottonseed oil and coal tar dye; short volume 4.2 fl. oz. in 1 gallon; name and address of packer not declared. Same as K. F.-377.
K.F.-663 K.F.-377	Bronx Bakery. <i>Utirol</i>	
K.F.-382	Jimmy's Tavern. <i>Superfine 100% Pure Olive Oil</i>	
	Jimmy's Tavern. <i>Superfine Pure Imported Olive Oil</i>	
E. S.-683	New Haven Washington Cash Grocery, Inc. <i>Bravo Brand Oil</i> ..	Declaration of "imitation olive oil" in small type; short volume 3.6 fl. oz. in 1 gallon.
E. S.-951	New York, N. Y. Michael Licata. <i>Pulcella Brand Fine Oil</i>	Contained peanut oil and a trace of cottonseed oil, artificially flavored and colored; short volume 3.9 fl. oz. in 1 gallon; name and address of packer not declared.
E. S.-952	Michael Licata. <i>Puglia Brand Super Fine Pure Oil</i>	Same as E. S.-951, except 8.3 fl. oz. short volume.
K. F.-665	Norwalk Anthony Balestrini. <i>Olive Oil</i>	Sample was mineral oil artificially flavored and colored.
E. S.-950	South Norwalk Mrs. Florence Balestieri. <i>Olive Oil</i>	Sample was mineral oil artificially flavored and colored.
K. F.-651 K. F.-653	Stamford March Bakery. <i>Cooking Oil</i>	Sample was mineral oil.
	J. Gerardi. <i>Marca D'Oro Pure Olive Oil</i>	Pure olive oil as labelled, but short volume 3.5 fl. oz. in 1 gallon.

	E.S.-769	E.S.-784
Solids	20.49	21.79
Ash	0.18	0.20
Total acidity as tartaric acid	0.53	0.61
Tartaric acid	0.35	.....
Total sugars as invert sugar	19.09	20.34
Non-sugar solids	1.40	1.45
Phosphoric acid (P ₂ O ₅) (mg./100cc.)	54.6	49.8

Comparison with known figures for authentic grape juice showed that this "Pure Grape Juice" contained about 48 per cent grape juice, 12 per cent added sugar and 40 per cent added water.

GUM

Eight official samples of chewing gum were examined. Five were tested for saccharin; none was found in any sample.

Three, K.F.-510, 647 and 648, were "Ivoryne Peroxide Chewing Gum", manufactured by Gum Laboratories, Inc., Clifton Heights, Pa. The label of this product stated that it was "made of gum base, corn syrup, sugar, artificial flavor, lime and calcium peroxide". Under the law chewing gum is classed as confectionery, and confectionery is adulterated if it contains a non-nutritive substance other than harmless resinous glaze not in excess of four-tenths per cent, harmless natural gum or pectin. Calcium peroxide is a non-nutritive substance, and if the Ivoryne Gum contained calcium peroxide it would be an adulterated food. Actually our tests for peroxide were completely negative on two of the samples; tests on the third indicated a possible faint trace of peroxide. The product was therefore misbranded because of false claims as to the presence of calcium peroxide. No doubt the calcium peroxide was put in by the manufacturers but became decomposed before the product was sold.

HONEY

One official sample of honey, F.-639, was examined and passed.

Nine samples were examined for the Entomology Department of this Station, which has been interested in the treatment of bees with sulfathiazole as a remedy for foul brood. One-half gram of the drug is dissolved in a gallon of 50 per cent sugar solution and fed to the bees; the treatment has proved to be a very effective cure. This department was requested to determine whether any of the sulfathiazole were transmitted to the honey made by the treated bees. There were no methods recorded in the literature for the determination of sulfa drugs specifically in honey, but it was found that the colorimetric method of Bratton and Marshall for sulfa compounds in urine¹, as modified by Gordon and Dunn², could be applied to our purposes with only slight modification. The method as we used it has been published.³

TABLE 3. HONEYS EXAMINED FOR SULFATHIAZOLE

Station No.	Total sulfathiazole fed to bees, grams	Sucrose per cent	Invert sugar per cent	Total sugars per cent	Sulfathiazole p. p. m.
3994	0.00	0.65	76.04	76.69	0
3995	1.44	3.04	72.28	75.32	1
3996	1.34	2.47	71.44	73.91	4
3997	1.34	2.85	72.32	75.17	6
3998	2.81	4.18	71.64	75.82	20
3999	2.81	2.13	73.56	75.69	16
4000	2.44	1.82	73.56	75.38	10
4001	2.06	2.05	73.60	75.65	2
4002	2.06	1.37	72.76	74.13	3

Sulfathiazole in amounts from 1 to 20 parts per million was found in the honeys from the treated hives; a check sample from an untreated hive showed a color by the method that would indicate less than 0.1 part per million. Analyses are given in Table 3.

MEAT AND MEAT PRODUCTS

Three samples of hamburg, one of salami and one of lambs' tongues submitted by the Dairy and Food Commissioner were passed. One sample of chopped meat, 3274, submitted by the New Haven Health Department, contained sulphite; another sample submitted by the same department did not; one sample of pork sausage submitted by a dealer was passed.

Horse Meat

Horse meat differs from most beef in having a darker red flesh and a fat that is distinctly yellow instead of white. The fat of old beef may, however, also be yellow. Raw horse meat may be detected by biological tests, but the reagents for performing these tests are not available in the ordinary laboratory. Horse fat is distinguished from the fat of beef, pork and mutton by its higher content of linolenic acid. A method for the detection and determination of horse fat in the presence of other animal fats based on this fact was devised by Paschke¹. Linolenic acid reacts with bromine to form a hexabromide that is insoluble in ether; in the Paschke method the fat is saponified, the fatty acids are separated and brominated, and the brominated linolenic acid (hexabromostearic acid) is filtered off and weighed. Paschke found one gram of horse fat to yield 41 milligrams of insoluble bromide, whereas the same amount of beef, pork or mutton fat gave only 3 milligrams. A translation of the Paschke method together with an account of our experience with the method is given in our 1942 Report.² Following the appearance of this report Crowell³ modified the Paschke method so that it would give more

¹ *J. Biol. Chem.*, **128**, 537 (1939).

² *Biochem. J.*, **35**, 1231 (1941).

³ *J. Assoc. Official Agr. Chem.*, **20**, 175 (1946).

¹ *Z. Unt. Lebensm.*, **70**, 476 (1938).

² *Conn. Agr. Expt. Sta. Bul.* **475**, 453-454 (1943).

³ *Assoc. Official Agr. Chem.*, **27**, 448 (1944).

precise results. He showed that by his modification mixtures of horse and beef or pork fats would give amounts of hexabromide that were proportional to the percentages of horse fat in the mixed fats.

The hexabromide values that he found for the pure fats, expressed as milligrams of hexabromostearic acid per gram of fat, were as follows:

Beef fat	2.0
Pork fat	7.5
Horse fat	56.8

Because horse meat is normally much leaner than beef, percentages of horse fat in the fat extracted from samples of meat cannot be converted directly into percentages of horse meat in the samples. A high bromide value does, however, indicate that horse meat is present.

Thirty-one samples of meat were submitted by the State Police and the Dairy and Food Commissioner in a market survey to determine to what extent horse meat was being sold for beef in Connecticut; hexabromide values were determined by the Crowell method on the fats from all but one of these samples. Twenty-three samples gave values between 0.2 and 4.5, averaging 1.5, and were passed. The following seven samples gave evidence of the presence of horse meat:

3356. Sold for pot roast of beef. Norwalk Public Market, Norwalk. Bromide value 61.6. Sample was straight horse meat.

K.F.-503. Sold for horse meat. Norwalk Public Market, Norwalk. Bromide value 16.5. Mixed horse meat and beef.

K.F.-520. Sold for beef. Norwalk Public Market, Norwalk. Sample consisted of lean meat with a layer of fat wrapped around it. Bromide value of fat extracted from the lean meat, 33.8; bromide value of the wrapping fat, 1.7. Lean meat was horse meat; wrapping fat was probably beef fat (suet).

K.F.-533. Sold for chopped beef. Norwalk Public Market, Norwalk. Bromide value 16.5. Mixed horse meat and beef.

3403. Authentic horse meat, U. S. Government stamped. Bromide value 58.4.

K.F.-564. Sold for chopped beef. Loudon's Market, Norwalk. Bromide value 12.3. Mixed horse meat and beef.

K.F.-565. Sold for beef for stew. Loudon's Market, Norwalk. Bromide value 91.7. Sample was straight horse meat.

MILK AND MILK PRODUCTS

Fluid Milk and Cream

Nineteen samples of fluid milk and cream were examined for the Dairy and Food Commissioner; five were definitely watered and six

were below standard. These 11 milks all came from the farm of Benjamin Bernstein of Newtown.

Fifty-seven samples were examined for local boards of health, producers and dealers. Many of these were submitted for fat determinations only, but 24 samples from the Bridgeport Health Department were found to be watered and one other sample from the same source was below standard. One sample submitted by a consumer was both watered and skimmed.

Condensed Milk

Three samples of sweetened condensed milk were analyzed for the Storrs Experiment Station with the following results:

Station No.	2941	2942	2943
Sucrose	43.7	43.1	43.5
Reducing sugars as lactose	15.51	14.72	9.26
Protein	10.43	10.12	9.64

4640. Sweetened condensed skim milk. Sucrose 39.91 per cent, protein 11.01 per cent, fat 0.43 per cent.

Vitamin D Milk

Vitamin D milk is generally 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 in this laboratory.

In the calendar year 1945, 104 samples were examined. Results of the assays are shown in Table 4. Only six were definitely below the unitage claimed. The percentage of samples fully or substantially meeting guaranties was 94.

In the 11-year period 1935-1945 inclusive, 922 samples have been tested and 91.2 per cent of them have contained the unitage claimed for them or were sufficiently close to the guaranties to be passed without question.

There are about 50 producers of vitamin D milk in this State at the present time.

POPCORN AND POTATO CHIPS

Forty-eight samples of popcorn and three of potato chips were submitted by the Dairy and Food Commissioner, mostly for examination for the presence of mineral oil. No mineral oil was found in potato chips, but it was present in 34 samples of popcorn. Three samples of popcorn whose labels emphasized the presence of butter actually contained little, if any, of this ingredient.

Previous to this year the substitution of mineral oil for edible oils and fats had been a rare form of adulteration. At the present

TABLE 4. SUMMARY OF ASSAYS OF VITAMIN D MILK

City or town	Dairy	No. of samples tested	Satisfactory	Passed	Below unitage claimed
Avon	Woodford Farm	3	2	...	1
Bloomfield	Chris. Neilsen & Sons	2	2	...	...
Bridgeport	Beechmont Dairy	1	1	...	...
	Dewhurst	2	2	...	...
	Marsh	3	1	1	1
	Mitchell	2	2	...	...
	Round Hill Dairy	2	2	...	...
Bristol	E. H. Elton	2	2	...	...
	Roberge Dairy	1	1	...	...
Clinton	Burr Dairy	2	1	1	...
Danbury	Riders Dairy	2	1	1	...
E. Hartford	Bergren Dairy Farms	2	2	...	...
Fairfield	Wade's Dairy	1	1	...	...
Forestville	Roberge Dairy	1	1	...	...
Greenwich	Round Hill Farms	2	2	...	...
Hamden	Brock-Hall Dairy	2	1	1	...
Hartford	Bryant & Chapman	4	4	...	...
	Cloverdale Dairy	2	1	...	1
	Farmers' Cooperative, Inc.	2	2	...	...
	Highland Dairy Co.	3	2	1	...
	H. P. Hood & Sons	2	1	...	1
	Lincoln Dairy	2	2	...	...
	R. G. Miller & Son	1	1	...	...
Kensington	Ferndale Dairy	2	2	...	...
Litchfield	Toll Gate Farms	2	2	...	...
Manchester	Dart's Dairy	2	2	...	...
	West Side Dairy	2	2	...	...
Meriden	Lawrence Bros.	2	2	...	...
	Meadow Brook Dairy	1	1	...	...
Milford	Cold Spring Farm	2	2	...	...
New Britain	Boyer Milk Co.	2	2	...	...
	Glendale Creamery	1	1	...	...
	Heslin Dairy	2	2	...	...
New Canaan	Miller Dairy Products, Inc.	2	2	...	...
New Haven	General Ice Cream Corp.	2	2	...	...
	H. P. Hood & Sons	3	2	1	...
Newington	Spring Brook Farm	3	2	1	...
New London	Radway's Dairy	2	2	...	...
No. Haven	Knudsen Dairy	2	2	...	...
Norwalk	Devine Dairy	2	1	1	...
	Horrick Dairy	1	1	...	...
	Mitchell Dairy	2	1	...	1
Oakville	Sanford's Overlook Farms, Inc.	2	2	...	...
Putnam	Deary Bros.	2	1	...	1
Springdale	Maplehurst Dairy	2	2	...	...
Stratford	Deering Dairy	2	2	...	...
Thompsonville	Skipton Dairy	2	2	...	...
Torrington	Torrington Creamery	2	2	...	...
Waterbury	Brookside Dairies	2	1	1	...
	Worden's Dairy	2	2	...	...
West Haven	Clark Dairy	2	2	...	...
W. Hartford	A. C. Petersen Farms	2	2	...	...
Westport	Ferris Dairy	1	1	...	...
	Totals	104	89	9	6

time, probably due to the shortage of fats and oils, and perhaps also because of the ceiling prices on the common fats, the practice is becoming much more common. Mineral oil has no nutritive value whatever, and there is considerable medical evidence that its ingestion in any quantity prevents the utilization of vitamins A and D and is otherwise harmful. The sale of mineral oil salad dressing has never been permitted except as such dressings were plainly labelled to show that they were intended for use in special diets where the calorie intake must be limited. The practice of "buttering" popcorn with mineral oil is wholly without justification.

The 34 samples of popcorn found to contain mineral oil in the present inspection represented only the two following brands:

Better Taste. Better Taste Popcorn Co., Anderson, Ind. Nineteen samples contained between 24.3 and 54.0 per cent of mineral oil, averaging 37.5 per cent. The labels of all samples declared the presence of popcorn, salt and U. S. certified color; eight of them declared "edible oil" and 11 declared "mineral oil (non-nutritive)". Those declaring edible oil were obviously adulterated; the samples declaring mineral oil were considered adulterated as being unfit for food in spite of the fact that mineral oil was declared.

The U. S. Food and Drug Administration has obtained a Federal injunction against the Better Taste Popcorn Co. restraining them from shipping their product in interstate commerce.

Tasty-Est Yet. Spuds, Chicago, Ill. Fifteen samples contained between 11.4 and 22.8 per cent of mineral oil, averaging 16.9 per cent. The declared ingredients of this brand in all cases were "selected popcorn, shortening, salt added".

Two brands of popcorn that did not contain mineral oil were misbranded because of misleading claims in regard to their butter content:

E.S.-1010 and 1013. Snacks. Confections, Inc., Chicago, Ill. The declared ingredients of this popcorn were "cane sugar, popcorn, corn syrup, creamery butter, animal and vegetable oil, salt and baking soda". The total fatty matter present was 2.5 per cent, not more than half of which was butter fat. In spite of this low butter content the label of the package was so designed as to give the impression that the "Snacks" were oozing with butter; in the upper right corner was a dripping pat of butter; in the lower left corner was a Negro girl surrounded by stacks of butter pats as high as she was that she was stirring into a dish of popcorn. In two places the label also said "It's butter rich".

N.-750. Nibbles Caramel Corn. Gold Medal Candy Corp., Brooklyn, N. Y. The declared ingredients of this popcorn were "popcorn, sugar, corn syrup, creamery butter, salt, bicarbonate sodium". The words "made with creamery butter" were prominently displayed.

Actually the total fat content was only 3.55 per cent, and not more than 4 per cent at most of this fat was butter fat, so if any butter at all were used the amount was about one-tenth of one per cent of the weight of the "Nibbles".

PRESERVATIVES

E.S.-706. Fermentation Inhibitor. Sethness Products Co., Chicago, Ill. This was sold "to prevent multiplication of yeast bacteria in beverages". It was labelled as "a quaternary amine solution with sodium chloride added". Total solids were 1.32 per cent; tests for quaternary ammonium compounds were positive.

W.-655. Meat Preservative. Manufacturer unknown. Sample was a mixture of sodium chloride, nitrite and nitrate.

E.S.-773. Bleach II R. New Haven Pickling Co., New Haven. This was a bisulphite preparation used to bleach sauerkraut.

PRESERVES

K.F.-694. Acme Brand Pure Raspberry Preserves. Senn Products Corporation, Brooklyn, N. Y. Examination of this product showed that it contained much raspberry fruit; saccharin was not present and no preservative nor any insects nor other filth were detected.

SALAD DRESSING AND MAYONNAISE

Twenty-eight official samples of mayonnaise, French dressing, French dressing substitute and other salad dressings were examined.

Four samples of mayonnaise were passed. None contained mineral oil.

Five samples of French dressing and French dressing substitute were examined as follows:

E.S.-982. Old Monk French Dressing. Old Monk Co., Chicago, Ill. Oil content was 10.3 per cent; mineral oil was not found.

E.S.-1021. Old Style French Dressing. Olds Products Co., Chicago, Ill. The oil present was cottonseed oil.

F.-621. Mos-ness French Sauce. Mosness Food Products, Boston, Mass. This sauce was declared to be "non-fattening". Previous samples were analyzed in 1941¹ and 1943², when 22 and 36 per cent of oil, and 16 and 18 per cent of sugar, respectively, were found. A product yielding between 262 and 396 calories per 100 grams cannot properly be described as "non-fattening".

¹ Conn. Agr. Expt. Sta. Bul. 460, 431 (1942).

² Ibid. Bul. 482, 340 (1944).

E.S.-866 and 960. Non Plus for Salads. Giroux Co., New York, N. Y. This dressing contained 31.4 per cent of mineral oil. The presence of "U. S. P. mineral oil" was declared on the label but in type difficult to read. The dressing was also stated to be "A dietary preparation (not a food), 1 ounce releasing 1/2 calorie". Because of these declarations, the product, since it was sold in small (1/2 pint) containers, would have been passed as a special dietary food if the typographical arrangement of the labelling had not been misleading.

Nineteen samples of other salad dressings were examined. Eight contained edible oils; in 11 the oil was mineral oil. Ten of these were "Suzanne Merry-Maise", manufactured by the Suzanne Processed Oil Co., Boston, Mass. This product was labelled as follows:

"Suzanne Merry-Maise—Non-nutritive dressing for salads for weight-reducing diets. Ingredients: U. S. P. mineral oil, eggs, salt, sugar, spices. Note: This product is prepared from (or contains) non-digesting mineral oil, its use should be limited to moderate quantities, not exceeding 3 tablespoons per day. Use as a condiment, not for the food value".

In addition there was a quantitative statement of composition, which in later samples read as follows: "By weight U. S. P. mineral oil non-nutritive 77%, protein 1%, digestible fats 2%, available carbohydrates trace". Earlier samples of this product, possibly because of a typographical error, claimed only one hundredth of these amounts.

Our examination showed that the "Merry-Maise" averaged 83.4 per cent of oil, substantially all of which was mineral oil. A more extended analysis of one sample, G.S.-475, led to the following estimated composition of the product: Mineral oil, 80.89; egg, 10.36; vinegar, 4.33; sugar, 1.91; salt, 1.07, and gums and other minor ingredients, 1.44 per cent.

Of the seven samples received in original containers, four were in gallon jars and one each was in a half pint, pint and quart jar. The smaller packages were passed as special dietary foods, but because it was obvious that bona fide sales of this dressing to persons requiring low-calorie diets would never be made in gallon quantities, the gallon packages were considered adulterated as being unfit for food in spite of the labelling. Three bulk samples were obtained from restaurants where there was reason to believe that the "Merry-Maise" had been dispensed to the patrons as mayonnaise, and in one case the inspector purchased at a restaurant, the Sylvandale Grill in Jewett City, a "lettuce-tomato sandwich with mayonnaise", E.C.-365, in which the "mayonnaise" ingredient was "Suzanne Merry-Maise".

A similar product, "Thallon-naise", was encountered in 1943, but has since disappeared from the market.¹

¹ Conn. Agr. Expt. Sta. Bul. 482, 341 (1944).

E.S.-961. Mrs. Boardman's Leanermaise. Leanermaise Co., Boston, Mass. This salad dressing contained 82.4 per cent of mineral oil, but was passed because it was sold in an 8 ounce container and was labelled as a special dietary dressing.

SARDINES AND ANCHOVIES

According to Food Inspection Decision 64 of the U. S. Department of Agriculture, the term "sardine" may be applied to any small canned clupeoid fish. American sardines are probably always small herring; European sardines are frequently pilchards. The term "anchovy" is also loosely applied; the dictionary¹ defines the anchovy as "any of a number of small herring-like fishes of the family Engraulidae, especially *Engraulis encrasicolus* of the Mediterranean".

European sardines are usually packed in olive oil, as are some American sardines, but cottonseed, peanut, soy and corn oils are also used. Sardines in olive oil command a higher price; during war times olive oil was scarce and expensive. It was therefore anticipated that unscrupulous packers might substitute cheaper oils and label their cans "packed in olive oil". In order to ascertain whether this form of adulteration were being practiced, the Dairy and Food Commissioner collected 80 market samples of canned sardines and anchovies and submitted them to this laboratory for examination.

Olive oil is distinguished from other vegetable oils (except tea-seed oil) in having a lower index of refraction and iodine number, and the determination of these constants is usually relied on to detect adulteration with those oils, such as corn and soy, for which there is no specific test. The natural oils of all fish, however, have relatively high indices of refraction and iodine numbers. Consequently, if, in packing sardines, an appreciable amount of oil from the fish were to become mixed with the packing oil, these constants would not afford reliable indications of the presence of olive oil. Voth², on the basis of experience with experimental packs, concluded that, in the case of Maine sardines, insufficient oil was exuded from the fish to affect materially the constants of the packing oil, and that these constants could be relied on to detect substitution of other oils for olive oil. He carefully restricted his statements to Maine sardines, however, and many of the sardines we were called on to examine were of Portuguese origin. The fish used in Voth's packs contained only 2 per cent of oil, an amount so small that even if all of it should mingle with the packing oil it would not substantially affect the composition of the much larger quantity of packing oil. In the case of Portuguese sardines, if more oily fish were used, the constants of the drained oil might not be so reliable an index of adulteration. In fact Marcille³, who compared the insoluble bromide values and other constants of authentic French sardine oils with the values found in the oil drained from experimen-

tal and commercial packs of sardines, claimed that the drained oil contained from 5 to 25 per cent of fish oil. A 25 per cent admixture of fish oil with olive oil would so seriously raise both the index of refraction and the iodine number that these values could no longer be relied on as indications of the substitution of other vegetable oils for olive oil.

There are specific tests for cottonseed, sesame and peanut oils that are not vitiated by the presence of oil from the fish. There are no such tests for corn and soy oils. In the lack of such tests it appeared to us that, when we found a drained oil to have a high index of refraction and iodine number, the only feasible way to decide whether these abnormal constants indicated contamination with fish oil or adulteration with another vegetable oil was to develop some method that would indicate the amount of fish oil that was present. If the percentage of fish oil were known, it would be possible to calculate what the constants of such a fish oil-olive oil mixture should be; if the constants of the drained oil were substantially higher than the calculated values, adulteration could be presumed. All fish oils contain large amounts of highly unsaturated fatty acids that react with bromine to yield ether-insoluble derivatives; vegetable oils, with the exception of a few drying oils like linseed, yield no more than a trace at most of ether-insoluble bromides. After a consideration of the various methods that have been proposed for the determination of these bromine derivatives, the method of Bailey and Johnson¹ was selected for study, because it did not require a preliminary saponification of the oil and could be adapted to the rapid examination of a large number of samples. Details of the method may be consulted in the original article; essentially it consists in treating an ice-cold solution of the oil in absolute ether with a solution of bromine in glacial acetic acid, allowing the reaction product to stand over night in the refrigerator, and then centrifuging, decanting the supernatant liquid, and drying and weighing the residue of insoluble bromides. Values are calculated as percentages by weight of the amount of oil taken.

About 6 pounds of fresh small herring², after discarding the heads and viscera, were ground in a mortar, extracted with petroleum ether, and the extract evaporated to yield about 100 gms. of authentic herring oil, our sample No. 3386. Ether-insoluble bromides were determined on this oil alone and on olive oil to which known amounts of the herring oil had been added. When the results were plotted a smooth curve was obtained which was not, however, a straight line (our experience agrees with that of Marcille in this respect). This curve was used to estimate the amounts of fish oil present in the drained oils from the market samples of sardines. The percentages of ether-insoluble bromides found in the various known mixtures of herring oil and olive oil are given in Table 5.

¹ Webster's New International Dictionary of the English Language, 1933, p. 81.

² J. Assoc. Official Agr. Chem., 27, 455 (1944).

³ Ann. Fals., 26, 398 (1933).

¹ Ind. Eng. Chem., 10, 999 (1918).

² Obtained through the courtesy of the Boston Station of the U. S. Food and Drug Administration.

TABLE 5. ETHER-INSOLUBLE BROMIDES FROM HERRING OIL-OLIVE OIL MIXTURES

Herring oil per cent	Ether-insoluble bromides per cent
5	0.84
10	2.23
15	4.10
20	6.35
25	8.10
30	9.97
40	15.21
100	46.25

Because it is known that soy oil contains a small amount (2-4 per cent¹) of linolenic acid, which does yield an ether-insoluble bromide, the Bailey-Johnson method was also applied to two authentic samples of soy oil, our Nos. 2634 and 4979. The first of these we prepared by extracting soy beans; the second was obtained from the Boston Station of the U. S. Food and Drug Administration. Sample 2634 yielded 0.34 per cent of ether-insoluble bromides; no weighable residue was obtained from No. 4979. It therefore appeared that the Bailey-Johnson method, in which the unsaponified glycerides are brominated, had an advantage for our purposes over the methods in which the fatty acids are separated before bromination, in that soy oil did not yield measurable amounts of insoluble bromides to confuse the calculation of the percentages of fish oil.

Table 6 lists all the data that were obtained on the 80 samples of market sardines and anchovies. The column headed "Estimated Per Cent Fish Oil" gives the percentage of fish oil present in the drained oil as calculated from our bromide values for known mixtures of herring oil and olive oil. Assuming that these amounts of fish oil were present, the figures in the column "Iodine No., calculated" were then computed on a proportional basis from the following average values of the iodine numbers of the various pure oils (the value for herring oil was that of our oil):

Oil	Iodine No.
Herring	141
Olive	83
Peanut	94
Cottonseed	111
Soy	132

A number of the samples were examined before this technique had been perfected. Some have been passed because the constants are within the normal limits for olive oil; for the others we believe that the data are insufficient to reach any conclusion as regards possible adulteration. For those samples where the insoluble bromides and the

¹ Jamieson, *Vegetable Fats and Oils*, 1932, p. 267.

iodine numbers were determined, the iodine number actually found exceeded the calculated iodine number by more than 4 units in only two cases. One of these samples, Fish 528, definitely contained peanut oil; the discrepancy in the case of the other, Smith 650, is unaccounted for. This method of correcting for the presence of fish oil therefore appears to have some value in the detection of the substitution of other vegetable oils for olive oil. The method could be relied on more implicitly if it were known that the iodine and bromide values of the oils of the fish were reasonably constant. Insoluble bromide figures for herring oil by the Bailey-Johnson method are not available in the literature; Brocklesby¹ lists iodine numbers for seven samples of herring oil ranging from 116 to 154, and averaging 140.4, a value that is extraordinarily close to the figure we found for our herring oil, 140.7.

There is one other determination that can be used as an indication of the presence of olive oil. Fitelson² showed that olive oil was distinguished from all other vegetable oils by its high content of the unsaturated hydrocarbon squalene. The average amount of squalene in olive oil is 330 mg./100 gm., as compared with average values for the other common oils ranging from 3 to 28 mg./100 gm. Our herring oil contained 40 mg./100 gm. of squalene; a squalene value approaching 300 therefore indicates that a packing oil is olive oil even though the refraction and iodine number may be high. The squalene value cannot be relied on to detect the adulteration of olive oil with a small percentage of another vegetable oil, however, as the range of values found for authentic olive oils, from 136 to 708, is too wide. Squalene values were determined on 14 of the samples in Table 6. Seven of these gave values between 210 and 398, averaging 300, and were passed; one, Smith 677, gave a value of 188 and was considered doubtful but was passed; another, Smith 680, which gave a value of only 158, was considered adulterated. The other five samples, which gave values between 20 and 183, were known to contain other oils than olive oil.

Of the total of 80 samples, 65 were labelled as sardines and 15 were anchovies. Fifty-seven samples of sardines were passed; six were considered adulterated with cottonseed or an unidentified vegetable oil; in one sample the fish were decomposed; and in one, packed without oil, the fish was actually salmon. Of the 15 samples of anchovies, only one was adulterated with peanut oil.

¹ Fisheries Research Board of Canada Bul. LIX, 1941, p. 48.

² J. Assoc. Official Agr. Chem., 26, 499 (1943).

TABLE 6. ANALYSIS OF OILS FROM CANNED SARDINES AND ANCHOVIES

No.	Re- fraction 25° C	Iodine no. found	Squalene mg./ 100 gm.	Ether- insoluble bromides, per cent	Halphen test	Estimated per cent fish oil	Iodine no. calculated	Remarks
Carlson 231	67.6	116	...	...	Negative	...	...	Data incomplete.
Carlson 232	68.8	123	...	...	Negative	...	...	Data incomplete.
Carlson 233	63.5	90	...	1.47	...	7	87	Constants normal for olive oil.
Fish 510	67.8	120	...	...	Negative	...	...	Data incomplete.
Fish 511	68.5	120	...	...	Negative	...	...	Data incomplete.
Fish 512	61.2	80	...	...	...	...	...	Anchovies; constants normal for olive oil.
Fish 513	61.4	81	...	...	...	...	...	Anchovies; constants normal for olive oil.
Fish 514	61.2	82	...	...	...	...	...	Anchovies; constants normal for olive oil.
Fish 515	66.3	100	...	...	Negative	...	...	Anchovies; constants normal for olive oil.
Fish 516	61.1	79	...	...	...	...	...	Data incomplete.
Fish 521	63.5	91	...	...	Negative	...	...	Constants normal for olive oil.
Fish 525	65.0	104	...	...	...	...	...	Data incomplete.
Fish 526	61.6	...	...	...	...	...	...	Anchovies; refraction normal for olive oil.
Fish 527	61.7	...	...	...	...	...	...	Anchovies; refraction normal for olive oil.
Fish 528	66.1	106	...	...	...	...	...	Anchovies; refraction normal for olive oil.
Fish 530	64.3	93	...	1.13	Negative	6	87	Anchovies; refraction normal for olive oil.
Fish 531	69.0	119	...	...	Negative	...	...	Anchovies; peanut oil present; adulterated.
Fish 532	64.5	96	...	...	Negative	...	...	Pass for olive oil.
Fish 533	61.1	...	...	...	...	...	...	Data incomplete.
Fish 534	68.3	116	...	...	Negative	...	...	Pass for olive oil.
Fish 535	61.1	...	...	...	...	...	...	Anchovies; refraction normal for olive oil.
Fish 536	65.6	...	...	...	...	...	...	Data incomplete.
Flanagan 383	62.8	98	...	8.73	Negative	26	98	Anchovies; refraction normal for olive oil.
Flanagan 384	62.6	85	...	...	Negative	1	...	Packing oil probably olive.
Flanagan 385	63.3	78	...	0.23	Negative	9	84	Constants normal for olive oil.
Flanagan 386	63.3	92	...	2.14	Negative	9	88	Constants normal for olive oil.
Flanagan 390	66.0	104	...	10.35	Negative	30	100	Constants normal for olive oil.
Flanagan 391	66.5	99	...	12.01	Negative	33	102	Packing oil probably olive.
Flanagan 393	63.5	...	...	...	...	...	...	Packing oil probably olive.
Flanagan 394	65.3	100	...	6.72	Negative	21	95	Refraction normal for olive oil.
Flanagan 402	68.6	111	...	...	Negative	...	...	Packing oil probably olive.
Newsom 596	66.4	105	...	...	Negative	...	...	Data incomplete.

TABLE 6. ANALYSES OF OILS FROM CANNED SARDINES AND ANCHOVIES—(Continued)

No.	Re- fraction 25° C	Iodine no. found	Squalene mg./ 100 gm.	Ether- insoluble bromides, per cent	Halphen test	Estimated per cent fish oil	Iodine no. calculated	Remarks
Newsom 597	65.2	97	...	...	Faintly positive	...	...	Constants normal for peanut oil as declared.
Newsom 598	68.3	118	...	...	positive	...	...	Data incomplete.
Newsom 599	66.9	108	...	...	Negative	...	...	Data incomplete.
Newsom 600	70.3	128	...	...	Negative	...	...	Data incomplete.
Newsom 601	68.3	114	...	...	Negative	...	...	Data incomplete.
Newsom 602	72.7	138	...	...	Negative	...	...	Data incomplete.
Newsom 603	69.5	123	...	...	Negative	...	...	Data incomplete.
Newsom 605	70.9	127	...	...	Negative	...	...	Data incomplete.
Newsom 733	66.0	103	...	9.35	Negative	27.5	99	Packing oil probably olive.
Smith 645	66.8	113	...	...	Negative	...	...	Data incomplete.
Smith 650	66.4	111	290	9.83	Negative	28.5	100	Packing oil probably olive on basis of squalene value.
Smith 654	65.8	99	...	...	Positive	...	...	Adulterated with cottonseed oil.
Smith 655	71.6	131	37	...	Positive	...	...	Packing oil cottonseed and soy as declared.
Smith 656	72.1	134	31	12.83	...	35	135	Packing oil soy as declared.
Smith 657	66.2	101	20	4.94	...	17	102	Packing oil peanut as declared.
Smith 658	65.2	99	...	...	Positive	...	...	Adulterated with cottonseed oil.
Smith 659	68.4	113	...	...	Positive	...	...	Adulterated with cottonseed oil.
Smith 660	61.4	82	...	...	...	...	...	Anchovies; constants normal for olive oil.
Smith 662	61.1	79	...	...	...	...	...	Anchovies; constants normal for olive oil.
Smith 663	61.1	78	...	...	...	...	...	Anchovies; constants normal for olive oil.
Smith 664	61.9	80	...	...	...	...	...	Anchovies; constants normal for olive oil.
Smith 665	69.3	117	308	...	Negative	...	...	Packing oil probably olive on basis of squalene value.
Smith 666	67.1	103	...	...	Negative	...	...	Contents were decomposed.
Smith 667	68.6	110	398	...	Negative	...	...	Packing oil probably olive on basis of squalene value.
Smith 668	65.4	94	...	...	Negative	...	...	Data incomplete.
Smith 669	68.9	111	282	...	Negative	...	...	Packing oil probably olive on basis of squalene value.
Smith 670	69.6	112	210	...	Negative	...	...	Packing oil probably olive on basis of squalene value.

TABLE 6. ANALYSES OF OILS FROM CANNED SARDINES AND ANCHOVIES—(Concluded)

No.	Re- fraction 25° C.	Iodine no. found	Squalene mg./ 100 gm.	Ether- insoluble bromides, per cent	Halphen test	Estimated per cent fish oil	Iodine no. calculated	Remarks
Smith 671	66.8	99	294	9.18	Negative	27	99	Packing oil probably olive.
Smith 672	67.3	106	320	.....	Negative	.....	.....	Data incomplete.
Smith 673	69.2	113	.....	.....	Negative	.....	.....	Packing oil probably olive on basis of squalene value.
Smith 674	61.8	100	125	9.40	Positive	27.5	99	Anchovies; refraction normal for olive oil.
Smith 675	65.8	101	183	.....	Positive	.....	.....	Adulterated with cottonseed oil.
Smith 676	65.3	126	188	.....	Negative	.....	.....	Adulterated with cottonseed oil.
Smith 677	70.3	115	.....	1.94	Positive	9	114	Doubtful but pass for olive oil.
Smith 678	68.5	101	158	.....	Negative	.....	.....	Packing oil cottonseed as declared.
Smith 680	66.1	98	.....	5.76	Negative	18.5	94	Not pure olive oil on basis of squalene value.
Smith 681	64.4	120	.....	.....	Negative	.....	.....	Constants only slightly high for olive oil; pass.
Smith 682	70.7	.....	.....	.....	.....	.....	.....	Corn and olive oil declared; presence of olive oil doubtful.
Smith 684	70.4	135	.....	.....	Negative	.....	.....	Data incomplete.
Smith 685	81.4	177	.....	.....	.....	.....	.....	Packed without oil; constants those of oil from fish (salmon).
Smith 909	63.3	90	.....	2.39	Negative	10	89	Constants normal for olive oil.
Weich 550	63.0	91	.....	.....	.....	.....	.....	Constants normal for olive oil.
Weich 553	62.5	.....	.....	.....	.....	.....	.....	Anchovies; refraction normal for olive oil.
Weich 555	62.9	83	.....	9.46	Negative	27.5	99	Constants normal for olive oil.
Weich 556	66.2	102	.....	8.87	Negative	26	98	Constants normal for olive oil.
Weich 557	64.8	96	.....	8.14	Negative	25	98	Packing oil probably olive.
Weich 558	67.7	110	.....	.....	Positive	.....	.....	Packing oil probably olive.
Weich 563	66.0	101	.....	9.08	Negative	27	99	Adulterated with cottonseed oil.
								Packing oil probably olive.

SAUERKRAUT

Sauerkraut is officially defined¹ as "The product, of characteristic acid flavor, obtained by the full fermentation, chiefly lactic, of properly prepared and shredded cabbage in the presence of not less than 2 per cent nor more than 3 per cent of salt. It contains, upon completion of the fermentation, not less than 1.5 per cent of acid, expressed as lactic acid. Sauerkraut which has been rebrined in the process of canning or repacking, contains not less than 1 per cent of acid, expressed as lactic acid".

Under this definition, and in the common understanding of the term, sauerkraut is the product obtained by allowing shredded cabbage to undergo natural fermentation in the presence of salt. A mixture of shredded unfermented cabbage and vinegar is not sauerkraut, but pickled cabbage. Comparatively few analyses of commercially canned sauerkraut have been recorded in the literature. The most extensive series is that of Pederson², who examined 332 samples obtained from packers throughout the country. As a result of these analyses he concluded that the composition of the liquid portion of satisfactory canned sauerkraut should be as follows:

	Ideal analysis per cent	Permissible analysis per cent
Total acidity as lactic acid	1.1 - 1.5	1.0 up
Volatile acidity as acetic acid	0.15 - 0.30	0.10 - 0.30
Ratio of volatile to non-volatile acid	0.20 - 0.30	0.15 - 0.35
Alcohol	0.15 - 0.25	0.10 - 0.35
Salt	1.7 - 2.4	1.5 - 2.5

In an earlier bulletin³ he states that cabbage contains from 3 to 4 per cent of sugar, while sauerkraut contains from a trace to none.

Because of the shortage of tin, government regulations during the war did not permit the packing of sauerkraut in tin cans. Such commercially packed sauerkraut as appeared on the market was put up in glass jars and was not sterilized. The addition of vinegar and sulphur dioxide as preservatives was permitted provided these ingredients were declared on the labels, but the substitution of unfermented cabbage for the fully fermented product was not permissible in a preparation labelled "sauerkraut".

Eight samples of sauerkraut were submitted by the Dairy and Food Commissioner. One was tested only for benzoic acid, which was not present. The other seven were drained and the liquid portion analyzed for total and volatile acidity, salt and sugar. Analyses are listed in Table 7.

¹ U. S. Dept. Agr. S. R. A. F. D. No. 2, 5th rev. (1936).

² N. Y. Agri. Expt. Sta. (Geneva) Bul. 603 (1940).

³ N. Y. Agri. Expt. Sta. (Geneva) Bul. 505 (1931).

TABLE 7. ANALYSES OF SAUERKRAUT

D. C. No.	Manufacturer and brand	Total acidity as lactic acid per cent	Volatile acidity as acetic acid per cent	Non-volatile acidity as lactic acid per cent	Ratio of volatile to non-volatile acidity	Salt per cent	Sugars as invert sugar per cent	Remarks
F.-599	H. M. Field, Inc., Brooklyn, N. Y.	1.35	0.29	0.91	0.32	1.33	0.57	Contains incompletely fermented cabbage.
N.-628	Field's Best Golden Pickle Works, Inc., Brooklyn, N. Y.	0.88	0.20	0.58	0.34	3.05	1.61	Contains incompletely fermented cabbage.
E.S.-768	Golden's La Salle Food Products Co., Detroit, Mich. Crown Brand "Ole Fashun"	0.65	0.18	0.39	0.46	2.42	0.00	Distilled vinegar declared. Product does not meet standards. Probably washed and rebrined.
N.-696	Morgan Packing Co., Austin, Ind. Scott Co.	1.01	0.38	0.45	0.84	3.20	0.29	Distilled vinegar declared; excessive salt; probably incompletely fermented.
E.S.-795	Mrs. Warner's Preserving Co., Elizabeth, N. J.	1.42	0.53	0.62	0.85	2.85	0.004	Vinegar declared; deficient in drained solids.
E.S.-765	Elizabeth, N. J. Mother May's Youner Pickle Co., Brooklyn, N. Y.	1.06	0.51	0.30	1.70	2.71	0.06	Vinegar declared.
E.S.-782	Joy Youner Pickle Co., Brooklyn, N. Y.	1.12	0.61	0.20	3.05	2.81	1.01	Vinegar declared; contains incompletely fermented cabbage.

SPAGHETTI AND SPAGHETTI SAUCE

Three official samples of canned spaghetti were examined as follows:

E.S.-767. Ingrao Spaghetti Dinner. Rudolf Ingrao, New Haven, Conn. Olive oil was declared and probably present.

E.S.-998. Ingrao Spaghetti. Ralph Ingrao, New Haven, Conn. Sample was adulterated because cottonseed oil had been substituted for the olive oil declared on the label.

E.S.-1011. Rudco Farms Brand Spaghetti. B. B. Delapenha & Co., Inc., New York, N. Y. The label declared the presence of soya oil, and our analysis substantiated this claim.

Eight official samples of spaghetti sauce were examined. Six of these were tested for saccharin. In one sample, C.G.-405, "A & S Prepared Sauces—Spaghetti Sauce", made by Arena, Salerni & Moran Mfg. Co. of New Britain, Conn., it was found to be present. The label declared saccharin, but its use in foods for general use is not permissible even when declared.

Two other sauces were tested for the presence of olive oil, which was declared on their labels. One of them, F.-749, "Palmieri Brand Home Made Italian Style Spaghetti Sauce", packed by A. Palmieri, New Haven, Conn., did not contain olive oil.

SPICES

Two official samples of black pepper and one of prepared horseradish were examined microscopically. No evidence of adulteration was found.

SPRAY RESIDUES

Since 1931 apples grown in the orchards of this State have been sampled by agents of the Dairy and Food Commission and tested in this laboratory for spray residue. During the season of 1945, 105 official samples and one sample submitted by an orchard owner were examined. Only two of these were found to exceed the present tolerances proposed by the U. S. Public Health Service and adopted by the U. S. Food and Drug Administration and by the Dairy and Food Commission of this State. The limits for lead and arsenic now recognized are 0.025 grain of arsenic trioxide (As_2O_3) and 0.050 grain of lead (Pb) per pound of fruit. Strictly speaking, these limits apply only to apples and pears. The two samples containing excessive spray residue were the following:

F.-727. Orchard of Merle T. Bilton, Somers. Lead 0.062 grain/lb.; arsenic trioxide 0.034 grain/lb.

F.-728. Orchard of W. S. Filer, Somers. Lead 0.071 grain/lb.; arsenic trioxide 0.032 grain/lb.

Two unofficial samples of grapes were examined for archardists, one of which, 3639, contained 0.078 grain of lead and 0.036 grain of arsenic trioxide per pound. A sample of red raspberries submitted by a member of the Station staff contained 0.22 grain of arsenic trioxide per pound and was definitely dangerous. A sample of grape juice contained only traces of lead and arsenic.

SWEET POTATOES

Nine official samples of "McGrath Sweet Potatoes, Syrup Pack", packed by the H. J. McGrath Co., Baltimore, Md., were examined. The total sugar content of the liquid portion varied between 5.60 and 8.04 per cent, averaging 7.33. There is no standard for the sugar content of syrup in sweet potatoes, but because in the Federal standards for fruits a minimum of 14 per cent of sugar is required before the fruit can be labelled "Packed in syrup" these sweet potatoes were considered misbranded.

SYRUPS

Fifteen official samples of syrups were examined. Eight of these were beverage base syrups that were tested for saccharin. This adulterant was found in one sample, K.F.-547, obtained from the National Spring Water Co. of Stamford.

Four chocolate syrups were examined by tasting. Two, E.S.-953 and E.S.-980, both Mary Lou Chocolate Flavored Syrups, made by J & R Syrup Co., New York, N. Y., had only a faint suggestion of chocolate flavor and were considered misbranded.

F.-710 and 711. Orange Flavor Syrup. Fox Bottling Works, Torrington. This was a base for making orange soda. Its examination was requested by the bottler because it made a poor quality beverage and he doubted whether it was a cane sugar syrup as claimed by his supplier. Our analysis showed 14.76 per cent of sucrose and 25.92 per cent of invert sugar in F.-710 and 1.45 per cent of sucrose and 32.77 per cent of invert sugar in F.-711. From the flavor of this product, the sweetening agent was probably either molasses or cane syrup.

E.S.-989. Mother's Pantry Syrup. Allied Molasses Co., Perth Amboy, N. J. This syrup was claimed to contain cane, corn and pure maple syrup. It contained 1.21 per cent of ash and had a Winton lead no. of 0.43. Some maple syrup may have been present, although the flavor was doubtful.

Sugars were determined in one sample each of molasses, corn syrup and beverage base syrup submitted by consumers.

- VINEGAR

One sample of vinegar submitted by a purchaser, 4639, was found to contain 4.33 per cent of acetic acid.

MISCELLANEOUS

Thirty-three official samples of miscellaneous products were submitted, mostly because of incomplete or unsatisfactory labelling. Eighteen were passed and 15 were adulterated or misbranded. Five samples of interest were the following:

F.-628. White Rose Peanut Butter. The label of this peanut butter declared it to contain 28.2 U. S. P. units of vitamin D per gram. Two assays by feeding tests on rats showed that the vitamin D present, if any, was distinctly less than the claimed amount.

S.-771. L-Cystine. The Keratene Co., Inc., Winsted. This was supposed to be pure laevo-cystine. On the basis of a total nitrogen determination, it was 99.2 per cent pure.

S.-770. Kera-CR. The Keratene Co., Inc., Winsted. This product is a dried protein hydrolysate containing salt. It is used as a flavoring for soups to impart a meaty flavor. On the basis of our analysis its composition is as follows: Amino acids calculated as casein, 52.38; salt, 33.93; other mineral matter, 4.97, and moisture and undetermined, 8.72 per cent. Qualitative spectrographic examination showed the presence of sodium, calcium, magnesium, strontium, potassium, phosphorus, iron, silicon and manganese, with traces of aluminum, lead and boron.

N.-624. Baker's Yellow Color. Baker Extract Co., Springfield, Mass. This color contained two permitted dyes, tartrazine and Ponteau 3 R.

E.S.-801. White Magic. Higgins Laboratories, Cromwell. This cleaning powder was trisodium phosphate.

Twenty-seven miscellaneous samples were examined for health officers and others. Analyses of five of these may be of interest:

2565. Liquid consumed by mistake with fatal results. The liquid was ethylene dichloride.

3062. Home canned asparagus. This sample, which was two years old, was submitted because it contained a deposit of fine needle-shaped crystals. The crystals were calcium sulphate, which is harmless.

3953 and 4102. Monosodium glutamate. These samples were submitted from different sources, in both cases with questions as to what monosodium glutamate was. Glutamic acid, α -aminoglutaric acid, is one of the amino acids formed by the hydrolysis of proteins. Its sodium salt imparts a meat-like flavor to foods, and for this reason it has been used considerably as a flavoring agent, particularly in soups. The two samples we examined were white powders that, on the basis of their nitrogen content, contained 89.4 per cent of monosodium glutamate.

4147. *Soya Sauce.* There are two kinds of soy sauce on the market. Originally in China it was the custom to ferment a mash prepared from soybeans and wheat. After the preliminary fermentation the mash was dried, ground, and placed in a strong brine. Here, a slow secondary fermentation took place which was allowed to continue for one or two years. At the end of this time the supernatant liquid was decanted. This liquid was "thin soy sauce". The residue was mixed with molasses and other ingredients to make "thick soy sauce". Present-day American manufacturers vary this procedure more or less. Thin soy sauce is used as a table sauce; most of the thick sauce goes into the manufacture of Worcestershire sauce.

The sample that we examined was a thin soy sauce. Analysis was as follows: Total solids, 38.24; salt, 17.47; ash, 18.79; sucrose, 6.92; reducing sugars, 3.96, and protein, 4.78 per cent.

DRUGS

ASCORBIC ACID TABLETS

Ascorbic acid or vitamin C tablets according to the U. S. P. XII must contain not less than 95 nor more than 120 per cent of the labelled amount of ascorbic acid. Thirteen official samples were examined. The declared dosages varied between 25 and 250 milligrams per tablet. Our analyses showed that all contained the claimed amounts of ascorbic acid.

BORIC ACID SOLUTION

Solution of boric acid according to the National Formulary VII must contain not less than 4.25 grams of boric acid in each 100 cc. The Formulary also requires that the solution "shall be dispensed perfectly clear and without a deposit of crystals of boric acid".

Twenty official samples were examined, of which 13 were passed and seven did not meet all the requirements of the N. F. VII. Results are given in Table 8.

TABLE 8. BORIC ACID SOLUTION

D. C. No.	Dealer	Boric acid gm./100cc	Remarks
Bristol			
S.-653	Modern Drug Store	4.67	O. K.
S.-649	Whelan Drug Stores	4.41	O. K.
Danielson			
W.-253	Rexall Drug Store	4.95	Large excess of crystals present.
W.-249	Woodward Drug Store	4.16	Pass.
East Hartford			
S.-568	Hartford Drug Co.	3.69	Labelled "Puretest lotion made from boric acid (3½%)"; not the official article called for.
Hartford			
S.-604	Highland Court Pharmacy	2.85	Below standard.
S.-633	Netherlands Pharmacy	4.72	O. K.
S.-598	Professional Pharmacy	4.64	O. K.
S.-639	D. G. Stoughton Co.	2.51	Below standard.
Jewett City			
W.-243	Cebas R. Carey	2.09	Below standard.
Middletown			
S.-671	Liggett Drug Store	4.70	O. K.
S.-682	Misenti's Drug Store	4.86	O. K.
S.-674	Pelton's Prescription Pharmacy	4.85	O. K.
Norwich			
W.-270	Lee & Osgood	4.85	O. K.
W.-264	Treat's Drug Store	3.38	Below standard.
Torrington			
S.-594	Samuel Siegel	4.74	O. K.
Uncasville			
W.-242	State Drug Store	4.18	Pass.
Westbrook			
W.-263	Westbrook Pharmacy	4.63	O. K.
Willimantic			
W.-261	Curran's Pharmacy	4.78	Deposit of crystals present.
W.-256	Nathan Hale Drug Store	4.16	Pass.

DILUTED HYDROCHLORIC ACID

The U. S. P. XII requires that diluted hydrochloric acid contain not less than 9.5 nor more than 10.5 grams of hydrochloric acid (HCl) in each 100 cc. Twenty-four official samples were examined, of which 20 were passed. The following four samples did not come reasonably close to the U. S. P. requirements:

D.C. No.	Dealer	Hydrochloric acid, gm./100 cc
S.-579	Nate's Drug Store, East Hartford	8.69
S.-631	Waterbury Drug Co., Waterbury	13.83
S.-656	Maple Pharmacy, Hartford	13.12
S.-709	Davis Drug Store, New Britain	8.51

MILD TINCTURE OF IODINE

Mild tincture of iodine is a U. S. P. preparation that is used chiefly for first aid treatment of minor cuts. It contains less iodine and

TABLE 9. MILD TINCTURE OF IODINE

D. C. No.	Dealer	Manufacturer	Iodine, gm./ 100 cc	Sodium iodide, gm./ 100 cc	Remarks
S-650	Bristol Boulevard Pharmacy	Premo Pharm. Labs., Inc., New York, N. Y.	2.00	2.40	O. K.
S-648	Central Drug Co.	Own make	2.60	2.44	Too strong in iodine.
W-251	Danielson Rexall Drug Store	United Drug Co., Boston, Mass.	2.02	2.06	O. K.
S-569	East Hartford Hartford Drug Co.	United Drug Co., Boston, Mass.	1.84	2.16	O. K.
S-574	Maxwell Drug Stores	Walgreen Co., Chicago, Ill.	2.18	2.59	O. K.
S-636	Colonial Pharmacy	Nyal Co., Detroit, Mich.	1.95	2.43	O. K.
S-634	Forest Drug Co.	Certified Pharmaceutical Co., New York, N. Y.	2.08	2.46	O. K.
S-711	Liggett's Drug Store	United Drug Co., Boston, Mass.	1.94	2.22	O. K.
S-661	Mandell's Pharmacy	Own make	2.06	1.26	Contained potassium iodide instead of sodium iodide.
S-632	Netherlands Pharmacy	Own make	2.25	1.52	Below standard in sodium iodide.
S-658	Reilly's Pharmacy	Purepac Corp., New York, N. Y.	1.69	2.78	Pass.
S-673	Parkview Pharmacy Middletown New London	Purepac Corp., New York, N. Y.	0.76	3.36	Below standard in iodine.
W-239	Whelan Drug Norwich	Whelan Drug Co., New York, N. Y.	2.07	2.43	O. K.
W-276	Lee & Osgood	Merck & Co., Rahway, N. J.	2.29	2.15	Pass.
W-266	Liggett's Drug Store Torrington	United Drug Co., Boston, Mass.	2.17	2.42	O. K.
S-590	Doyle's Drug Store Waterbury	Own make	2.47	2.02	Too strong in iodine.
S-618	Paul's Drug Store Willimantic	Schiffelin & Co., New York, N. Y.	1.97	2.56	O. K.
W-257	Wilson's Pharmacy	Own make	2.62	2.53	Too strong in iodine.

is weaker in alcohol than the regular tincture, and is less irritating; it contains sodium iodide in place of the potassium iodide of the stronger tincture. The U. S. P. XII requires that each 100 cc. contain between 1.8 and 2.2 grams of free iodine and between 2.1 and 2.6 grams of sodium iodide.

Eighteen official samples were examined and 12 passed. Results are given in Table 9.

NICOTINAMIDE TABLETS

Nicotinamide is also known as "niacinamide". It is one of the vitamins of the B group. The U. S. P. XII requires that nicotinamide tablets contain not less than 95 nor more than 120 per cent of the labelled amount of nicotinamide.

Three official samples of 50 milligram tablets were examined. They contained between 47.5 and 47.6 milligrams per tablet and all were passed.

POTASSIUM PERMANGANATE SOLUTION

To test the druggists' accuracy in compounding a simple preparation that cannot be bought ready prepared from drug manufacturers, the inspectors were requested to purchase samples of a one-tenth of one per cent solution of potassium permanganate. A solution of this strength is sometimes prescribed by physicians as a poison ivy remedy.

Nineteen samples were obtained. Fifteen contained between 0.085 and 0.126 per cent of potassium permanganate and were passed. The four following samples were definitely too strong or too weak:

D.C. No.	Dealer	Potassium permanganate per cent
W.-267	Lee & Osgood, Norwich	0.141
S.-608	Wilson Drug Co., Wilson	0.038
S.-651	Boulevard Pharmacy, Bristol	0.140
S.-662	Bliss Pharmacy, Hartford	0.131

SACCHARIN TABLETS

The U. S. P. XII requires that saccharin tablets contain not less than 95 nor more than 120 per cent of their declared amounts of soluble saccharin. Fifteen samples were examined; eight were quarter grain and seven were half grain tablets. All except the following three were passed:

D.C. No.	Manufacturer	Saccharin, grains per tablet	
		Declared	Found
S.-727	Whelco Products, Inc., New York, N. Y.	0.25	0.32
S.-733	Merck & Co., Inc., Rahway, N. J.	0.25	0.33
S.-737	Park Laboratories, New York, N. Y.	0.50	0.66

SOLUTION OF POTASSIUM ARSENITE

This drug is also, and more commonly, known as Fowler's Solution. The U. S. P. XII requires that each 100 cc contain not less than 0.95 nor more than 1.05 grams of arsenic trioxide (As_2O_3). The present official preparation is uncolored and unflavored. At one time Fowler's Solution was colored and flavored with compound tincture of lavender, but such a preparation has not been official for 10 years.

TABLE 10. SOLUTION OF POTASSIUM IODINE

D. C. No.	Dealer	Potassium iodide, gm./100 cc	Remarks
Bristol			
S.-644	North End Pharmacy	97.0	O. K.
S.-645	Tucker's Drug Store	93.0	Pass.
S.-643	Wilcox Pharmacy	97.0	O. K.
Danbury			
S.-696	Culhane's Pharmacy	97.0	O. K.
S.-695	Ideal Pharmacy	97.2	O. K.
S.-685	Ziegler's Drug Store	88.7	Pass.
Danielson			
W.-252	Rexall Drug Store	91.7	Pass.
East Hartford			
S.-581	People's Drug Store	85.9	Below standard.
Hartford			
S.-614	Bellevue Drug Store	99.6	O. K.
S.-637	Colonial Pharmacy	101.7	O. K.
S.-616	Eddie's Pharmacy	90.5	Pass.
S.-635	Forest Drug Co.	85.2	Below standard.
S.-612	Merkin's Pharmacy	0.1	Labelled "Sol. Potassium Iodide 0.1%"; not the official preparation called for.
S.-599	Professional Pharmacy	98.6	O. K.
S.-659	Reilly's Pharmacy	99.6	O. K.
S.-611	Vic's Pharmacy	90.0	Pass.
S.-663	Wilmore Pharmacy	67.5	Below standard.
Middletown			
S.-680	Cronin's Drug Store	102.6	Excess crystals present; pass.
S.-667	Joseph P. Kinsella	78.5	Below standard.
S.-683	Misenti's Drug Store	101.0	O. K.
S.-665	Murphy's Drug Store	86.3	Below standard.
S.-675	Pelton's Prescription Pharmacy	94.6	Pass.
New Britain			
S.-699	City Drug Store	90.3	Pass.
New London			
W.-238	Whelan Drug Co.	101.0	O. K.
Norwich			
W.-269	Lee & Osgood	102.6	O. K.
Torrington			
S.-592	Frank's Drug Store	102.6	Excess crystals present; pass.
S.-584	Torrington Pharmacy	11.3	Labelled "Sol. Potassium Iodide 10%"; not the official preparation called for.
Waterbury			
S.-626	Carroll Cut Rate	98.9	O. K.
Wilson			
S.-609	Wilson Drug Co.	99.3	O. K.

Twenty-one official samples were examined; all except the following three were passed:

D.C. No.	Dealer	As ₂ O ₃ , gm./100cc.	Remarks
S.-572	Thomas & Hammer, East Hartford	1.13	Colored and flavored; not U.S.P. XII.
S.-606	A. Laschever, Hartford	1.20	Too strong.
S.-642	Wilcox Pharmacy, Bristol	0.90	Colored and flavored; not U.S.P. XII.

SOLUTION OF POTASSIUM IODIDE

The National Formulary VII requires that Solution of Potassium Iodide contain not less than 97 nor more than 103 grams of potassium iodide in each 100 cc. Twenty-nine official samples were examined and 22 passed. Results are given in Table 10.

SYRUP

Simple syrup of the U. S. P. XII is made by dissolving 850 grams of sucrose (cane sugar) in sufficient water to make 1,000 cc. Syrups of lesser strength or made with other sugars than cane sugar may not be sold for simple syrup nor used in compounding drugs where simple syrup is called for.

Seventeen official samples were examined for the Dairy and Food Commissioner. Seven were of the proper composition and strength or reasonably approached thereto. Results are given in Table 11.

MISCELLANEOUS DRUGS

Twenty samples of miscellaneous drugs were submitted by the Commissioner and nine were received from other sources. Samples of interest were the following:

S.-565. Certified Brand Aspirin Tablets. Certified Aspirin Co., Inc., New York, N. Y. Aspirin declared: 5 grains. Found: 4.97 grains.

S.-556. Aime Double Strength Peroxide. Aime, New York, N. Y. Ordinary hydrogen peroxide solution contains between 2.5 and 3.5 grams of hydrogen peroxide in each 100 cc. This sample contained 5.43 grams per 100 cc of hydrogen peroxide, and therefore was double strength as claimed.

S.-554. Elixir Phenobarbital U. S. P. XII. Standard Drug Co., Newark, N. J. This was a pale yellow liquid with an odor of oranges. It contained 0.37 gm./100 cc of phenobarbital, 24.68 gm./100 cc of sucrose and 16.27 per cent of alcohol. The phenobarbital concentration was correct for Elixir of Phenobarbital U. S. P. XII, but the U. S. P. XII preparation contains only about half as much sugar and is colored with amaranth, a red dye. The U. S. P. XII First Supplement elixir contains 40 gm./100 cc of sucrose and is also colored with ama-

TABLE 11. SYRUPS

D. C. No.	Dealer	Sucrose, gm./100cc	Dextrose gm./100cc	Total sugars gm./100cc	Remarks
S.-725	Avon Pharmacy	37.65	4.67	42.32	Below standard.
S.-758	Hartford				
S.-764	Arthur Drug Stores	68.61	2.91	71.52	Below standard.
S.-769	Capitol Pharmacy	59.20	.....	59.20	Below standard.
S.-757	Farber's Pharmacy	26.18	27.65	53.83	Too weak; sugar not all sucrose.
S.-760	Fine Drug Co.	62.34	3.04	65.38	Below standard.
S.-756	Kazarian's Colonial Pharmacy	88.25	.....	88.25	O. K.
S.-762	Professional Pharmacy	39.30	14.67	44.97	Too weak; sugar not all sucrose.
	Ratner's Pharmacy	62.51	.....	62.51	Below standard.
	New Britain				
S.-729	Axelrod's Pharmacy	88.25	.....	88.25	O. K.
S.-739	Belvidere Drug Store	87.04	.....	87.04	O. K.
S.-736	Park Street Pharmacy	68.97	.....	68.97	Below standard.
S.-732	West End Pharmacy	72.12	.....	72.12	Below standard.
S.-765	Putnam				
	Edward H. Burt	89.67	.....	89.67	O. K.
S.-720	Winsted				
S.-717	Bannon's Drug Store	90.37	.....	90.37	O. K.
	City Pharmacy	.....	.....	83.30	Labelled "Pure cane sugar-corn syrup-imitation vanilla flavor".
S.-719	Opera House Pharmacy	82.12	.....	82.12	Pass.
S.-716	Seecery & Ivery	85.52	.....	85.52	O. K.

ranth. This sample therefore, while it contained the correct amount of phenobarbital, was not the official preparation as labelled.

W.-234. *Atlas Light Mineral Oil*. Atlas Drug & Chemical Co., Inc., New York, N. Y. This sample had a specific gravity at 25° C. of 0.8465 and a Saybolt viscosity at 100° F. of 95.2 seconds; qualitative tests for impurities of the U. S. P. were negative, and it was passed.

2552. *Prescription No. 34634*. Prescription called for demerol; the sample was paregoric.

P.-76. *Prescription No. 6375*. White tablets. From our analysis the composition of these tablets was as follows: Aspirin, 4.99; phenobarbital, 0.22, and dicalcium phosphate, 2.18 grains.

P.-71. *Pulvules Sodium Amytal*. Eli Lilly & Co., Indianapolis, Ind. Declared: sodium amytal 3 grains per capsule. Found: 3.00 grains per capsule.

3052. *Stomach Aid*. M. Von Horsten, Terryville, Conn. Declared composition was: bismuth subnitrate, powder rhubarb, sodium thiosulfate, alcohol 7 per cent. Our analysis showed 6.13 per cent of alcohol, 0.75 gm./100 cc of bismuth subnitrate and a thiosulfate and an anthraquinone drug present.

W.-236. *Vi-Tabs*. Vi-Tabs Distributors, New Haven, Conn. These tablets were claimed to contain 5,000 U. S. P. units of vitamin A and 500 U. S. P. units of vitamin D. Rat feeding tests showed that the vitamin D claim was justified.

COSMETICS

Seven official samples of cosmetics were submitted by the Dairy and Food Commissioner and eight were examined for individuals. The analysis of two of these was not significant.

4369. *Arrid*. Our analysis showed that this deodorant was an oil-in-water base cream containing 24.03 per cent of aluminum sulphate ($Al_2(SO_4)_3 \cdot 18H_2O$) and 17.42 per cent of urea.

S.-549. *Baby Oil with Genuine Imported Olive Oil*. Devon Laboratories, New York, N. Y. This preparation was claimed to contain 1,000 U. S. P. XI units of vitamin D to the fluid ounce. Assays in this laboratory by feeding to rats showed not only that the oil contained little, if any, vitamin D, but that known vitamin D added to the oil was destroyed or inhibited.

3145 and 3146. *Black Nite Dr. Ellis Nail Polish*. Dr. Ellis Sales Co., Inc., Pittsburgh, Pa. A bottle of this polish was claimed to have exploded on shaking. Our analysis showed the presence of nitrocellulose, ethyl acetate and a dye. Such a mixture is highly inflammable and may be potentially explosive under certain conditions, but nitrocellulose is commonly used as the lacquer ingredient of nail

polishes and this is the first casualty we have heard of. The "explosion" may have been due to a combination of expansion of the solvent by heat and a defective bottle.

S.-557. Brace-Hair Tonic. McKesson & Robbins, New York, N. Y. This was a pale yellow perfumed liquid, neutral to litmus, containing 66.6 per cent of isopropyl alcohol. Benzoic and cinnamic acids were separated from the petroleum ether-soluble portion after saponification. The ingredients were not further identified.

S.-782. Golden Peacock Bleach Creme. Golden Peacock, Paris, Tenn. This sample declared the presence of 1 per cent of ammoniated mercury; we found 1.33 per cent. The product did not bear adequate warning statements against the dangers of the use of mercury compounds and it was deceptively packed in that the carton was much larger than the jar of cream that it contained.

3850. Hair Restorer. Sample was a colorless liquid that appeared to be chiefly a solution of chloral hydrate in isopropyl alcohol.

S.-547. Hand Lotion with Olive Oil and Lanolin. Lander Co., New York, N. Y. Total solid content of this lotion was 5.86 per cent; the balance was water and perfume.

4368. Hush Cream Deodorant. Carter Products, Inc., New York, N. Y. This deodorant was claimed to contain aluminum sulphate. Aluminum sulphate and urea were present.

4370. Ipana Tooth Paste. Bristol-Myers Co., New York, N. Y. Analysis showed that this tooth paste was a soap and chalk preparation strongly flavored with spearmint.

P.-70. Nestle Cold Wave Regular. Nestle-Lemur Co., New York, N. Y. This sample consisted of a package containing a 4 ounce bottle of "Nestle Cold Wave Solution", an envelope of "Neutralizer Powder" and a paper cap. The "Cold Wave Solution" was a pale reddish violet alkaline solution containing 5.41 per cent of ammonium thioglycollate, 1.06 per cent of free ammonia, a wetting agent and perfume. The "Neutralizer Powder" which, according to directions, was to be dissolved in water and mixed with hydrogen peroxide solution, was a wetting agent, probably of the alkyl sulphate type.

F.-542. Nutrine Padettes (Hair Lacquer Pads). Middlebrook Lancaster, Inc., Brooklyn, N. Y. These were submitted on a complaint that they made hair turn red. They were perfumed felt pads impregnated with a potassium salt of a synthetic resin. The pads were alkaline, and the alkalinity might produce a color change on some dyed hair; we did not observe such a change with normal hair.

S.-772. Oils of the Wilderness. Frances Denny, Philadelphia, Pa. This was a face cream containing a mixture of essential oils including eucalyptol.

COLLABORATION WITH OTHER DEPARTMENTS

Samples analyzed for other Federal, State and Station departments, and not included in other reports from this laboratory, totalled 397, distributed as follows:

	Samples
U. S. Geological Survey (water)	91
State Department of Health (narcotics)	24
Station departments:	
Biochemistry	13
Entomology	266
Forestry	1
Soils	2
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	397

BABCOCK GLASSWARE, etc.

As required by Sections 2463 and 2488 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	Imperfect or inaccurate
Babcock glassware	1,260	10
Thermometers	92	11
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	1,352	21

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