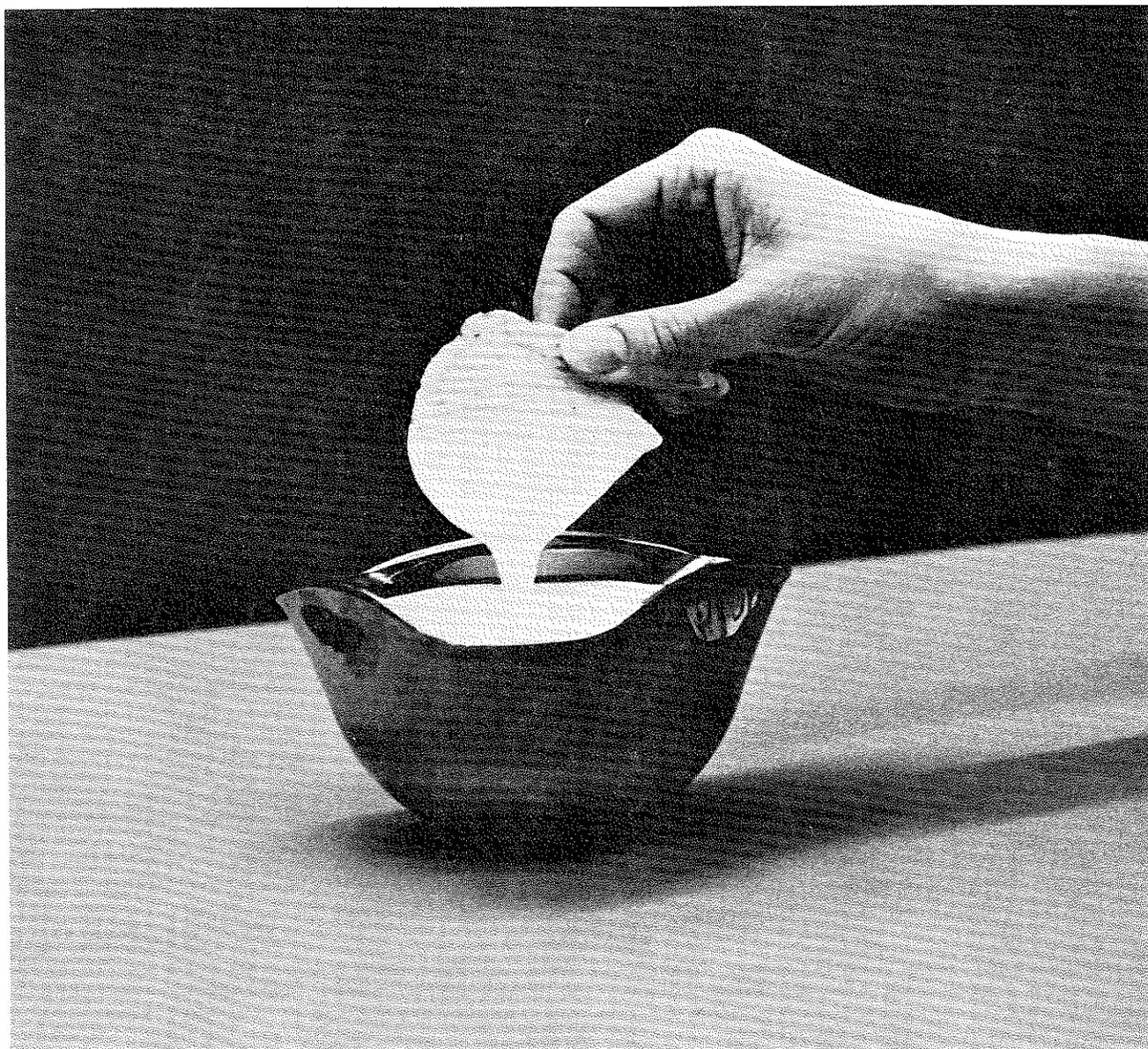


QUALITY OF CHIP DIPS

*A Cooperative Study by the Connecticut Department of Agriculture
and The Connecticut Agricultural Experiment Station*

By Lester Hankin, Donald Shields, and J. Gordon Hanna



**BULLETIN 794 • THE CONNECTICUT AGRICULTURAL
EXPERIMENT STATION NEW HAVEN • APRIL 1981**

Lester Hankin and J. Gordon Hanna are on the staff of The Connecticut Agricultural Experiment Station in New Haven. Donald Shields is on the staff of the Dairy Division, Connecticut Department of Agriculture, in Hartford. Requests for additional copies should be addressed to Publications, The Connecticut Agricultural Experiment Station, P.O. Box 1106, New Haven, CT 06504.

QUALITY OF CHIP DIPS

By Lester Hankin, Donald Shields, and J. Gordon Hanna

A dip is defined by Webster's New International unabridged dictionary as "a liquid or semiliquid flavoring or savory sauce into which solid food is dipped or which is served especially on a dessert or pie."

Most people think of chip dips as a flavored product made with a dairy product base into which potato chips, crackers, or raw vegetables are dipped and consumed as a snack or with a beverage. Different flavorings provide for a variety of tastes.

Many chip dips are prepared at home from cultured dairy products, usually sour cream, cream cheese, or yogurt. Onions, chives, clams, bacon, horseradish, blue cheese, and more exotic materials are added for flavoring.

For those who do not wish to prepare their own dips, a wide variety of flavored chip dips are sold from refrigerated cases at food stores. Cream cheese (usually whipped), with added flavoring (examples are onion, chive, lox), is also sold for use as a dip or spread.

There are no standards pertaining to chip dips (except for flavored cream cheese), but they must comply with general Connecticut regulations (6). This means that they must be prepared from wholesome ingredients, additives must conform to levels established by the Federal Food and Drug Administration, and labeling must be in compliance with State regulations. Labeling must show the major ingredient (the one in the highest

concentration) first and all other ingredients in order of decreasing concentration.

Cream cheese containing other foods must contain at least 33% milk fat in the cheese used and at least 27% in the finished food. Moisture cannot be more than 60% (1).

In this study we analyzed chip dips and cream cheese spreads available in food stores in Connecticut for their nutritional and microbial quality.

METHODS

Thirty-eight samples of chip dips and six cream cheese spreads were collected at food stores in Connecticut during October through December 1980. The collection, microbiological and chemical analyses and calculations are described in our previous Bulletins on quality of yogurt (2), juice drinks (3), cottage and ricotta cheese (4), and egg nog (5).

RESULTS AND DISCUSSION

Types of dips and additives: The 44 samples listed in Table 1 include 18 different brand names. Some brands are produced by the same manufacturer. We did not attempt to collect every flavor made by each manufacturer; instead, we obtained a random selection from each manufacturer. Fifteen samples were onion-flavored and four others contained onion in combination with another flavor. Seven samples were blue-cheese flavored, six

Table 1. Additives and nutrients in dairy and non-dairy chip dips and cream cheese spreads

Sample number	Brand, flavor, manufacturer	Base ingredient	Days to code date ¹
<u>Dairy Dips</u>			
1	Borden, French onion sour cream dip (Borden, Columbus, OH)	cultured cream	2
2	Borden, clam and lobster dip (Borden, Columbus, OH)	cultured milk and cream	30
3	Breakstone's, sour cream blue cheese dip (Breakstone's-Kraft, Walton, NY)	sour cream	124
4	Breakstone's, sour cream clam dip (Breakstone's-Kraft, Walton, NY)	sour cream	157
5	Breakstone's, sour cream bacon and horseradish dip (Breakstone's-Kraft, Walton, NY)	sour cream	124
6	Breakstone's, sour cream cucumber and onion dip (Breakstone's-Kraft, Walton, NY)	sour cream	139
7	Dairylea, French onion dip made with sour cream (Dairylea Coop, Vernon, NY)	sour cream	79
8	Dairylea, blue cheese dip made with sour cream (Dairylea Coop, Vernon, NY)	sour cream	79
9	Heluva Good, blue cheese dip (Heluva Good Cheese, Sodus, NY)	sour cream	33
10	Heluva Good, French onion dip (Heluva Good Cheese, Sodus, NY)	sour cream	29
11	Heluva Good, clam dip (Heluva Good Cheese, Sodus, NY)	sour cream	26
12	Kraft, French onion-sour cream dip (Kraft, Glenview, IL)	sour cream	104
13	Kraft, blue cheese, cream cheese and blue cheese dip (Kraft, Glenview, IL)	cream cheese	129
14	Kraft, bacon and horseradish-sour cream dip (Kraft, Glenview, IL)	sour cream	103
15	Kraft, creamy cucumber with onion-sour cream dip (Kraft, Glenview, IL)	sour cream	91
16	Kraft, neufchatel cheese with onions-spread (Kraft, Glenview, IL)	neufchatel cheese	155
17	Sealtest, bacon and horseradish dip-made with sour cream (Kraft, Glenview, IL)	sour cream	152
18	Sealtest, blue cheese dip-made with sour cream (Kraft, Glenview, IL)	sour cream	142
<u>Non-Dairy Dips</u>			
19	Allen, chive-onion chip dip (Allen Milk Co., Columbus, OH)	vegetable fat	9
20	Allen, clam chip dip (Allen Milk Co., Columbus, OH)	coconut oil	9
21	Allen, artificially-flavored bacon-onion chip dip (Allen Milk Co., Columbus, OH)	coconut oil	53
22	Allen, blue cheese chip dip (Allen Milk Co., Columbus, OH)	vegetable fat	9
23	Allen, jalapena chip dip (Allen Milk Co., Columbus, OH)	vegetable fat	7
24	Borden, French onion dip (Borden, Houston, TX)	hyd. vegetable oil	33
25	Daitch, French onion flavored dip (Shopwell, New York, NY)	hyd. coconut & soybean oil	66
26	Dip Delight, clam dip (American Whipped Products, Mt. Vernon, NY)	hyd. vegetable oil	122
27	Dip Delight, French onion dip (American Whipped Products, Mt. Vernon, NY)	hyd. vegetable oil	115
28	Edwards, French onion chip dip (Pick & Pay Supermarkets, Maple Hts. OH)	vegetable fat	22
29	Hickory Farms, French onion party dip (Hickory Farms of Ohio, Toledo, OH)	coconut oil, cream	63
30	Hickory Farms, garlic party dip (Hickory Farms of Ohio, Toledo, OH)	coconut oil, cream	64
31	Hickory Farms, blue cheese flavored dip (Hickory Farms of Ohio, Toledo, OH)	coconut oil, cream	51
32	King Dip, non-butterfat New England clam dip (American Whipped Prod., Mt. Vernon, NY)	hyd. vegetable oil	162
33	King Dip, non-butterfat French onion dip (American Whipped Prod., Mt. Vernon, NY)	hyd. vegetable oil	148
34	Old Dutch, chive-onion chip dip (Old Dutch Country House, Buffalo, NY)	coconut oil	10
35	Old Dutch, artificially flavored bacon-onion chip dip (Old Dutch Country House, Buffalo, NY)	coconut oil	51
36	Shop Rite, French onion dip (Wakefern Food Corp., Elizabeth, NJ)	hyd. vegetable oil	54
37	Zesty, imitation bacon & onion party dip (Royal Food Products, Indianapolis, IN)	hyd. soybean oil	84
38	Zesty, French onion party dip (Royal Food Products, Indianapolis, IN)	hyd. soybean oil	85
<u>Cream Cheese Spreads</u>			
39	Philadelphia, whipped cream cheese with chives (Kraft, Glenview, IL)	cream cheese	187
40	Philadelphia, whipped cream cheese with onions (Kraft, Chicago, IL)	cream cheese	183
41	Waldbaum's whipped cream cheese with chives (Waldbaum, Central Islip, NY)	cream cheese	17
42	Zausner's, whipped cream cheese with onions (Zausner Foods Corp., New Holland, PA)	cream cheese	26
43	Zausner's, whipped cream cheese with lox & onions (Zausner Foods Corp., New Holland, PA)	cream cheese	41
44	Zausner's, whipped cream cheese with lox (Zausner Foods Corp., New Holland, PA)	cream cheese	68

Footnotes to Table 1.

1. Number of days remaining to code date (date stamped on container) at purchase.
2. 28.4 grams = 1 ounce (about 2 tablespoons).

Quality of Chip Dips

Additives Declared						Nutrients Found						
Artificial color	Artificial flavor	Monosodium glutamate	Acidulant	Hydrolyzed vegetable protein	Sweetener	Fat (%)	Protein (%)	Carbohydrate (%)	Calories (no./28.4 g) ²	Sodium (mg/100 g) ³	Acidity (%) ⁴	Sample number
-	-	+	-	+	+	21.7	4.0	0.5	59	398	0.81	1
+	-	+	+	-	-	9.0	2.2	7.5	33	495	1.08	2
-	-	-	-	-	-	17.6	3.8	5.7	55	871	0.85	3
-	-	+	-	+	-	14.9	4.0	4.8	47	688	0.65	4
-	-	+	+	-	-	16.3	4.7	3.6	50	874	0.75	5
-	-	+	+	-	+	16.3	3.3	3.9	49	552	1.04	6
-	-	+	-	+	+	18.1	3.5	6.4	56	473	0.69	7
-	-	+	-	+	+	18.4	4.0	3.8	55	470	0.92	8
-	+	+	-	-	+	17.1	4.2	4.5	52	243	1.00	9
-	-	+	-	+	+	17.2	5.0	3.7	53	260	0.79	10
-	-	+	-	+	+	16.1	5.7	6.1	52	380	0.94	11
+	-	+	-	+	+	13.7	3.6	6.2	45	695	0.63	12
-	-	-	-	-	-	23.3	3.5	7.7	71	888	0.85	13
-	-	+	+	-	-	18.7	3.4	4.2	55	704	0.84	14
+	-	+	+	-	+	17.1	3.8	4.5	52	448	0.84	15
-	-	-	+	+	+	19.8	3.5	8.1	63	768	0.83	16
-	-	+	+	-	-	16.7	2.2	5.9	51	680	0.90	17
-	-	-	-	-	-	18.7	5.0	3.3	56	715	1.19	18
+	-	-	+	+	+	15.2	2.7	5.7	47	348	0.82	19
+	+	+	+	+	+	14.9	3.6	5.5	48	745	0.85	20
+	+	+	+	-	+	16.2	3.6	4.8	50	378	0.64	21
-	+	-	+	-	-	15.0	1.8	7.1	48	285	0.84	22
+	-	+	+	-	+	15.1	2.0	7.5	49	290	0.78	23
+	+	-	-	+	+	8.9	4.2	5.4	31	455	1.13	24
+	+	+	+	+	+	17.0	3.2	5.3	52	110	0.72	25
+	+	-	+	+	-	12.5	4.6	5.5	43	215	0.89	26
-	+	+	+	-	+	12.8	2.8	6.7	43	530	0.91	27
-	-	+	+	+	+	15.4	3.5	4.9	48	208	0.76	28
+	-	+	-	+	+	17.6	4.5	4.3	54	805	1.00	29
+	-	+	-	-	-	17.7	3.9	3.8	53	768	0.87	30
+	-	-	+	-	+	17.0	5.1	3.8	53	430	1.12	31
+	+	-	+	+	-	13.2	2.7	7.0	44	173	1.03	32
-	+	+	+	-	+	12.8	3.2	6.4	43	430	1.01	33
-	-	+	+	-	+	13.4	2.4	7.0	44	416	0.84	34
+	+	+	+	-	+	14.3	4.0	4.8	46	498	0.71	35
+	+	+	+	+	+	16.9	2.7	6.4	42	355	0.80	36
+	+	+	+	+	+	14.1	2.9	9.7	50	418	1.06	37
+	+	+	+	+	+	13.2	3.6	8.2	46	335	1.26	38
-	-	-	+	-	-	32.0	7.5	3.0	92	523	0.90	39
-	-	-	+	+	+	28.5	7.2	5.6	86	683	0.99	40
-	-	-	-	-	-	33.3	7.0	2.7	94	340	0.84	41
-	-	+	+	+	+	31.6	7.0	5.8	93	578	1.74	42
-	-	-	-	-	-	27.0	8.9	4.9	83	470	1.05	43
-	-	-	-	-	-	27.7	8.5	1.8	81	450	1.11	44

3. mg = milligrams; g = grams.

4. Expressed as % lactic acid.

Table 2. Microbiological analysis and sorbate content of chip dips and cream cheese spreads

Sample number	Dairy Dips	Brand and flavor	Bacteria (no./g)	Yeasts (no./g)	Coliform bacteria (no./g)	Acid producers (no./g)	Gram negative bacteria		Sorbate	
							proteolytic (no./g)	lipolytic (no./g)	claim	found (%)
1	Borden, French onion		1,200	<10	<10	270	85	25	+	0.010
2	Borden, clam and lobster		220	30	<10	25	35	<10	+	0.031
3	Breakstone's, blue cheese		83	<10	<10	30	5	<10	-	0
4	Breakstone's, clam		55	<10	<10	30	5	<10	-	0
5	Breakstone's, bacon & horseradish		150	<10	<10	50	<10	<10	-	0
6	Breakstone's, cucumber & onion		55	<10	<10	15	10	<10	-	0
7	Dairylea, French onion		1,000	<10	<10	45	45	68	+	0
8	Dairylea, blue cheese		170	<10	150	65	10	5	+	0
9	Heluva Good, blue cheese		200,000	<10	<10	2,800	10	5	+	0
10	Heluva Good, French onion		190,000	<10	<10	180	20	<10	+	0
11	Heluva Good, clam		12,000	<10	<10	130	170	850	+	0
12	Kraft, French onion		550	<10	<10	200	300	200	-	0
13	Kraft, cream cheese & blue cheese		<10	<10	<10	<10	5	<10	-	0
14	Kraft, bacon & horseradish		130	<10	<10	<10	5	<10	-	0
15	Kraft, creamy cucumber		<10	<10	<10	50	<10	<10	-	0
16	Kraft, Neufchatel cheese with onion		110	<10	150	43	25	5	-	0
17	Sealttest, bacon & horseradish		<10	<10	<10	30	<10	20	-	0
18	Sealttest, blue cheese		95	20	55	65	10	<10	-	0
<u>Non-Dairy Dips</u>										
19	Allen, chive & onion		2,600	320	<10	<10	200	290	+	0
20	Allen, clam		2,600,000	310	5	<10	85	50	+	0.013
21	Allen, artificially flavored bacon - onion		6,000	180	<10	<10	450	190	+	0
22	Allen, blue cheese		3,500	570	<10	120	10	<10	+	0
23	Allen, Jalapena		12,000	300	<10	<10	55	35	+	0
24	Borden, French onion		400,000	150	<10	23,000	120	65	+	0
25	Daitch, French onion flavored		14,000	10	<10	330	30	15	+	0
26	Dip Delight, clam		300	<10	<10	<10	<10	<10	+	0.023
27	Dip Delight, French onion		650	<10	<10	<10	5	25	+	0.013
28	Edwards, French onion		1,100	120	<10	<10	250	130	+	0.010
29	Hickory Farms, French onion		21,000,000	180	45	550	800	360	+	0
30	Hickory Farms, garlic		35,000,000	110	50	1,000	75	15	+	0
31	Hickory Farms, blue cheese		11,000,000	140	550	<10	10	<10	+	0
32	King Dip, clam		200	70	15	<10	10	10	+	0
33	King Dip, French onion		400	130	<10	<10	30	5	+	0
34	Old Dutch, chive-onion		680	<10	<10	<10	<10	35	+	0.033
35	Old Dutch, bacon - onion		7,700	<10	<10	<10	<10	160	+	0.027
36	Shop Rite, French onion		4,500	<10	<10	48	95	35	+	0
37	Zesty, bacon & onion		1,400	<10	<10	<10	220	110	+	0
38	Zesty, French onion		7,200	<10	<10	800	120	140	+	0
<u>Cream Cheese Spreads</u>										
39	Philadelphia, with chives		860	<10	<10	85	25	<10	-	0
40	Philadelphia, with onions		1,800	<10	20	610	50	10	-	0
41	Waldbaum's, with chives		560	<10	65	30	110	60	-	0
42	Zausner's, with onions		1,300	<10	15	100	90	43	-	0
43	Zausner's, with lox & onions		16,000	100	<10	180	80	280	-	0
44	Zausner's, with lox		5,600	<10	<10	160	50	40	-	0

Footnote to Table 2.

1. A zero level means less than 0.001%.

were clam or lobster-flavored, and five were flavored with bacon and horseradish.

Chip dips offered for sale fall into two distinct groups: those having a milk fat base and those with a vegetable oil base. The dips containing a milk fat base are referred to as dairy dips and those with a vegetable oil base as non-dairy dips. Data in Tables 1 and 2 are divided into these two categories.

Those dips made with a milk fat base (18 samples) usually had sour cream as the base ingredient. One sample contained Neufchatel cheese as the base (sample 16) and one contained cream cheese as the base (sample 13)(Table 1). Other dairy products including nonfat milk solids, cream, and skim milk, were used in some dips. In some, cheese was used as flavoring; primarily blue cheese. In all cases, however, a dairy product containing milk fat was the first ingredient listed on the label, thus indicating it is the most plentiful in the product.

The second type, the non-dairy dips, is represented by 20 samples in Tables 1 and 2. The vegetable oil base is usually hydrogenated to make it a semi-solid, since many edible vegetable oils, such as soy, corn, and cottonseed, are usually liquid. The exception is coconut oil, which is solid or semi-solid at room temperature or colder. Water was the first ingredient listed on the label of many of these non-dairy dips (the ingredient in the highest concentration). Some, however, listed skim milk first. A few non-dairy dip labels listed cream, nonfat milk solids, sodium caseinate, or whey solids; all are derived from milk. The only other dairy ingredient listed was cheese for flavoring. The nonfat milk solids and sodium caseinate add solids. These are probably used, however, to give the dip a dairy (white) appearance.

All dips, except one (sample 15), declared on the label that stabilizer or thickener was used. These included materials such as flour, gelatin, starch, vegetable gums, tapioca, pectin, carrageenan, and cellulose gum. All non-dairy dips indicated on the label use of an emulsifier such as lecithin or mono- or diglycerides to help keep fat dispersed. Eleven of the 18 dairy dip labels stated that an emulsifier was used.

Dairy dips with sour cream or cream cheese as a base use a naturally fermented dairy product. The fermentation provides many compounds formed by lactic acid bacteria which give a characteristic flavor to the product. Non-dairy dips usually do not use

fermented dairy products, therefore flavoring is added. The label on one dip (sample 24) stated that cultured skim milk was one ingredient. Only one dairy dip package (sample 2) but 13 of the non-dairy dips, declared use of artificial flavor (Table 1). Fifteen of the 20 non-dairy dip labels, but only one dairy dip label, listed use of artificial color (Table 1).

Interestingly, four of the dairy dip labels declared vegetable oil in addition to milk fat (samples 5, 9, 11, 17) (Table 1). Three of these were bacon-horseradish-flavored. Monosodium glutamate (MSG), a flavor enhancer, was listed as an ingredient in 28 of the dips.

Some labels stated that an acidifier, likely to make the product more tart, was used. Although all except two of the non-dairy dips indicated an acidifier as an ingredient, only seven of the dairy dip labels listed this ingredient (Table 1). In dairy dips most of the acidity or tartness is provided by the fermentation products produced by lactic acid bacteria in the dairy product used as the base. In non-dairy dips the acidity is provided by added lactic acid, lemon juice, citric acid, or vinegar (acetic acid).

Hydrolyzed vegetable protein was indicated as being present in 19 dips (Table 1). This material, presumably added to provide a heavier consistency, also increases the protein content. Some form of sweetener was declared on the label of 26 dips. Sweeteners included sugar and corn syrup solids (hydrolyzed corn starch).

All of the non-dairy dips and seven of the dairy dip labels listed the preservative sorbate. However, only two of the dairy dips and six of the non-dairy dips were found to contain this material (Table 2). A possible reason for sorbate not being found where it is listed as added is that it may have been degraded by bacteria present in the sample. None of the labels on the cream cheese spreads declared sorbate and none was found.

The labels on six cream cheese spreads shown in Table 1 listed few additives. All declared use of a stabilizer; three, an acidulant; two, a sweetener; and two, hydrolyzed vegetable protein (Table 1). Analysis showed that all complied with fat and moisture content requirements.

The number of days from purchase to last day of sale stamped on the carton ranged from 2 to 187 days (Table 1). Thus, some chip dips and cream cheese dips are dated over 6

months from day of manufacture.

Microbial quality: In general, the dairy dips were of better microbial quality than the non-dairy dips (Table 2). The analysis for total number of aerobic bacteria per gram showed that, overall, the dairy dips contained fewer contaminating bacteria than the non-dairy dips. Only two dairy dips (samples 9, 10) were excessively high in total number of aerobic bacteria, but five of the non-dairy dips (samples 20, 24, 29, 30, 31) were excessively high. Yeast and mold contamination in the dairy dips was minimal, but there was considerable yeast contamination among the non-dairy dips. Less than 10 molds per gram (the lower limit of detectability by our test) were found in all samples except for sample 14 (100 molds) and sample 10 (38 molds). The 100 molds per gram in sample 14 are not significant since this is a blue cheese dip and live organisms could have been used to help develop the blue cheese flavor. Samples with a large number of coliform bacteria (more than 10 per gram), an indication of unsatisfactory packaging techniques, were about evenly divided between dairy and non-dairy dips.

In dips not using a fermented dairy product, the number of acid-producing bacteria can give an indication of potential keeping quality. Excessive growth of acid producers, which are contaminants in a pasteurized non-fermented product, could make the dip too tart. Relatively few acid producers were found among all samples except for sample 24. Since dips are kept refrigerated, probably for a long time, psychrotrophic bacteria (those able to grow at refrigeration temperatures) can be important to keeping quality. Many of the psychrotrophic bacteria are gram negative bacteria and thus we tested for gram negative bacteria able to degrade fat (lipolytic) and protein (proteolytic), the major ingredients in dips. All samples contained fewer than 1,000 per gram, with many less than 100 per gram. We do not intend to imply however, that 1,000 bacteria per gram are unimportant since dips are expected to have a long shelf life and psychrotrophic bacteria over a long period of time can grow and produce compounds which can give an off-flavor to the product.

All the cream cheese spreads were generally of good microbial quality (Table 2).

All samples had a satisfactory flavor when purchased. However, flavor and consistency varied considerably from brand to brand and in the same flavor among brands.

Personal taste and cost enters into choice of purchase, therefore we did not attempt to rate the dips or spreads on flavor.

Nutrient quality: The amount of fat in the dairy dips ranged from 9.0 to 23.3%, with an average of 17.3%. The non-dairy dips averaged 14.7% fat with a range from 8.9 to 17.7%. The cream cheese spreads contained considerably more fat, averaging 30.0% (Table 1).

The average protein content of dairy dips was 3.9% and for non-dairy dips 3.4%. Cream cheese spreads averaged 7.7% protein. Carbohydrates in dairy dips averaged 5.0%, non-dairy dips 6.0%, and cream cheese spreads 4.0% (Table 2).

The caloric content of the dairy and non-dairy dips was similar. The average for the dairy dips was 53 calories per 28.4 grams (one ounce or about 2 tablespoons) and for non-dairy dips 47. The cream cheese spreads were much higher, averaging 88 calories per 28.4 grams (Table 1). For comparison, 28.4 grams of creamed cottage cheese contains about 27 calories and lowfat cottage cheese about 20 calories (4).

Many persons need to restrict their salt intake, therefore we analyzed the dips for sodium content (Table 1). The dairy dips averaged 589 milligrams of sodium per 100 grams, but the range was wide (from 243 to 888). The non-dairy dips also showed a wide range in sodium content (from 110 to 805 milligrams per 100 grams), with an average of 410 milligrams. Thus, on the average, the non-dairy dips contained about 30% less sodium than the dairy dips. The cream cheese spreads averaged 507 milligrams sodium per 100 grams. The average amount of sodium in cottage cheese was 472 milligrams per 100 grams (4).

The acidity of all samples, a measure of tartness, expressed as % lactic acid, is shown in Table 1. Both types of dips had, on the average, about the same acidity, although a few samples (example, samples 18, 38) were more acid. One cream cheese spread, (sample 42), was extremely tart.

CONCLUSIONS

Two types of chip dips are offered for sale in food stores in Connecticut. One type contains a milk fat base, usually sour cream, a fermented dairy product. The second type contains a non-milk fat base, hydrogenated vegetable oil. Flavored cream cheese is also

used as a dip or spread. The labels of the dairy dips in general declared fewer additives and were generally of better microbial quality than the non-dairy dips. Seven samples of dips contained excessive numbers of aerobic bacteria. All samples were of satisfactory flavor when purchased.

Dairy dips contained more fat (average 17.3%) than the non-dairy dips (average 14.7%) but the range in fat content was considerable. Caloric content was essentially the same for both types of dips; about 50 calories per 28.4 grams (about 2 tablespoons). The cream cheese spreads contained more calories than the chip dips; 88 calories per 28.4 grams.

Only two of seven dairy dips and six of 20 non-dairy dips declaring use of sorbate were found to contain this preservative. The sodium content of dairy dips averaged 589 milligrams per 100 grams and the non-dairy dip averaged 410 milligrams.

ACKNOWLEDGMENTS

We thank Susan Marafino, Sunrae McLean,

Mamie Pyles, John Hayes, and Richard Hastings for the microbial and chemical analyses and Heather Leary for help in collecting samples.

REFERENCES

1. Code of Federal Regulations, Title 21-Food and Drugs (21CFR 133.134), 1977, Food and Drug Administration, Washington, DC.
2. Hankin, L. and D. Shields. 1980. Quality of Yogurt. The Conn. Agric. Experiment Station, New Haven. Bulletin 785.
3. Hankin, L., D. Shields, and J.G. Hanna. 1980. Quality of Juice Drinks. The Conn. Agric. Experiment Station, New Haven. Bulletin 790.
4. Hankin, L., D. Shields, and J.G. Hanna. 1980. Quality of Cottage Cheese and Ricotta Cheese. The Conn. Agric. Experiment Station, New Haven. Bulletin 791.
5. Hankin, L., D. Shields, and J.G. Hanna. 1980. Quality of Egg Nog. The Conn. Agric. Experiment Station, New Haven. Bulletin 793.
6. Uniform Food, Drug and Cosmetic Act. Chapter 342 General Statutes of Connecticut, revised to 1981.