

*The
Connecticut
Agricultural
Experiment
Station,
New Haven*

*Bulletin 897
January 1992*

Nutrient Analysis of Frozen Yogurt and Other Frozen Desserts

BY LESTER HANKIN
AND VIPIN K. AGARWAL

A cooperative study by The Connecticut
Agricultural Experiment Station and
the Food Division of the Connecticut
Department of Consumer Protection

SUMMARY

Twenty frozen yogurts and 32 frozen dessert pops were tested for relation of amount of nutrients claimed per serving size and the amounts found. In the 52 samples of frozen yogurts and pops examined, 38 made a claim for calories. Of these, 13 contained more than the +20% allowed under FDA labeling regulations.



The Connecticut Agricultural Experiment Station, founded in 1875, is the first experiment station in America. It is chartered by the General Assembly to make scientific inquiries and experiments regarding plants and their pests, insects, soil and water, and to perform analyses for State agencies. The laboratories of the Station are in New Haven and Windsor; its Lockwood Farm is in Hamden. Single copies of bulletins are available free upon request to Publications; Box 1106; New Haven, Connecticut 06504. ISSN 0097-0905

Nutrient Analysis of Frozen Yogurt and other Frozen Desserts

BY LESTER HANKIN AND VIPIN K. AGARWAL

Frozen desserts, such as yogurt and those frozen onto sticks, are popular with both children and adults. Because of the current concern about weight and intake of calories, many manufacturers list nutritional claims for protein, fat, carbohydrates, and calories on the label.

Nutrient labeling must comply with Federal Regulations (Code of Federal Regulations). These regulations allow for some variation in claims since the same nutrient designations and claims may be used for a wide variety of different flavors of the same product. For example, the same nutrient claim might be used for both vanilla and peanut butter flavors or chocolate and peach. All nutritional labeling must show the amount of nutrient per serving size. The serving size must be declared in relation to the average or usual serving size for a specific product, but the manufacturer has considerable leeway. The Regulations allow up to a 20 percent excess in nutrient over label claim, and reasonable deficiencies are accepted (Code of Federal Regulations, 1990).

Among nutrients usually listed, calories per serving may be expressed to the nearest 2 calorie increment up to and including 5 calories, but rises to 10 calorie increments above 50 calories. Protein, fat, and carbohydrates may be declared to the nearest gram, but if less than one gram it can be so stated.

In this Bulletin we report the nutrient content of various frozen products and include analysis for calories, protein, fat, carbohydrates, and for some products, sodium and potassium.

METHODS

Samples of frozen products were collected at retail stores in Connecticut from June through September 1991 by an inspector of the Food Division of the Connecticut Department of Consumer Protection. They were kept frozen during transport and until tested.

All analyses were performed on a weight basis by AOAC Methods (Methods of Analysis) and then converted to amount per fluid ounce. Fluid ounces for pops were determined by the method described in Net Contents of Packaged Foods (NBS Handbook). Fluid ounces for yogurt products were determined by measuring the volume of a weighed amount of product. Carbohydrates were calculated by difference. Calories

were calculated based on four calories per gram of protein and carbohydrate, and nine calories per gram of fat. Sodium and potassium were quantified by Inductively Coupled Plasma Atomic Emission Spectrometry, after a one gram sample was ashed at 550 C and the ash dissolved in concentrated HCl acid.

RESULTS AND DISCUSSION

Twenty samples of frozen yogurt and like desserts, representing 15 different processors, were tested. Data in Table 1 show the product tested, the brand name, and flavor. Results of analysis are shown based on the serving size as designated by the processor. When no claims for nutrients were listed, an estimated serving size, based on comparable products, was used to calculate amount per serving size.

A summary of the data for individual samples of frozen yogurts listed in Table 1 is presented in Table 2. The average claim for calories was 103 per serving but ranged from 70 to 140. The average percent of claim for calories was 33% over claim, and all samples were greater than the claim. In contrast, fat averaged 7.7% less than claim, but ranged from 60% under to 10% over claim. In general, calories and carbohydrates were above claim while fat and protein were close to the amount claimed. Thirteen samples made a claim for protein, carbohydrate and calories, but only ten made a claim for fat. Eight samples were over the 20% FDA allowance for calories, and ten were over the allowance for carbohydrate (Table 2). Only two samples were over the 20% allowance for protein. Data for individual samples are in Table 1. The eight samples with over 20% excess of claim for calories were also over 20% for carbohydrates, and two of these were over 20% for protein.

In Table 3 is the analysis of 32 samples of frozen dessert pops and similar products. The table shows the brand name, manufacturer, and flavor, as well as analyses for calories, protein, fat, carbohydrates, sodium, and potassium. Twenty four manufacturers are represented. For each nutrient the amount claimed and found per serving size is shown.

A summary of the data in Table 3 is presented in Table 4. The average claim for calories was 55.5 per serving, but the average number found was 67. The

Table 1. Analysis of frozen yogurt and similar desserts.

Type/Brand/Flavor	Protein, gms.		Fat, gms.		Carbohydrate, gms		Calories		Serving size, fl. oz.
	CL	FD	CL	FD	CL	FD	CL	FD	
FROZEN DAIRY DESSERT									
Brigham's-choc/raspberry	3	2.6	0	0.7	25	42.9	110	189	4
Simple Pleasure-chocolate	9	7.9	1	0.4	25	26.6	140	142	4
Sweet N Low-chocolate	3	3.4	2	1.6	18	24.5	80	126	4
FROZEN YOGURT									
Columbo-vanilla dream	3	2.5	2	2.2	16	17.5	90	99	3
Crowley-strawberry	2	1.5	2	1.6	17	23.1	90	112	3
Elan-blueberry	4	3.9	3	2.8	28	27.2	135	149	4
Food Club-vanilla	2	2.6	2	2.2	14	18.9	80	106	3
Friendly's- raspberry	4	4.8	3	2.3	19	25.8	110	142	4
Haagen Dazs-strawberry	4	3.0	3	3.0	21	25.5	120	140	3
Hood-strawberry	3	2.8	2	2.2	22	26.8	120	138	4
ICBY-blueberry		2.8		3.3		28.6		155	4*
ICBY-nonfat coffee		3.5		0.4		23.4		111	4*
ICBY-nonfat vanilla		3.7		0.4		24.8		118	4*
ICBY-peanut butter		3.7		5.8		24.9		165	4*
Sealtest-nonfat vanilla	2	2.4	0	0.1	23	33.0	100	143	4
Sweet N Low-peach swirl	3	2.8	<1	0.5	20	28.4	70	129	3.5
TCBY-chocolate		4.0		3.0		26.0		147	4*
TCBY-peach		4.5		2.8		24.5		141	4*
Yoplait-strawberry	2	3.0	2	2.1	16	22.3	90	121	3
YOGURT POPS									
Daily's-chocolate	<1	0.5	<1	1.1		16.6		78	2

CL=claim; FD=found

* after serving size indicates estimated serving size

average over claim for calories was 16.4%. Protein and fat averaged less than claim but the range was wide, since many samples listed a claim of 0 which decreased the calculated average value. The amount of carbohydrates found was generally above the amount claimed. In all, five samples were over the 20% excess in calories allowed and of these, three were also over the 20% for carbohydrates. Sodium and potassium levels were variable (Table 4).

Three samples claimed a calorie content lower than that calculated based on the amount of protein, fat, and carbohydrate as guaranteed on the label. These products contained polydextrose, a bulking agent. Polydextrose, a carbohydrate composed of dextrose units randomly bonded together, is metabolized by the body differently from other carbohydrates and only provides one calorie per gram as compared to four calories per gram for other carbohydrates. Thus the label claims for calories for these products were essentially correct from a physiological point of view but not from an analytical chemical view.

ACKNOWLEDGEMENTS

We thank Kevin Gallagher for collecting the samples and John McGuire, Chief of the Food Division of the Connecticut Department of Consumer Protection for arranging the collection. Skillful analyses were performed by John Hayes, Mamie Pyles, and Craig Musante.

REFERENCES

Code of Federal Regulations (1990) Title 21, section 101. U.S. Government Printing Office, Washington, DC.

Official Methods of Analysis (1990), 15th edition, K. Helrich, editor. Association of Official Analytical Chemists, Arlington, VA.

NBS Handbook 133 (1988), 3d Edition, Checking The Net Content Of Packaged Goods, C.S. Brickenkamp, S. Hasko, M.G. Natrella, editors. U.S. Dept. of Commerce, National Bureau of Standards, Gaithersburg, MD.

Table 2. Summary of nutrient values per serving size for frozen yogurt and like desserts.

Nutrient	No. ¹	Avg. claim (range) ²	Avg. % of claim found (range)	Avg. amount found ³	No. >20% over claim
Calories	13	103 (70-140)	+33.0 (+1 to +84)	133	8
Protein	13	3.4 gms (<1-9)	+1.9 (-25 to +50)	3.3	2
Fat	10	2.2 gms (0-3)	-7.7 (-60 to +10)	1.9	0
Carbohydrates	13	20.3 gms (14-28)	+30.0 (-3 to +72)	25.6	10

¹ No. = Only samples designating a claim greater than <1 or 0 used in calculations of average claim

² Range of values includes values of <1 and 0.

³ 20 samples tested.

Table 3. Analysis of frozen desserts and pops.

Brand/Processor/Flavor	Serv. size, oz.	Protein		Fat		Carbohydrate		Calories		Sodium		Potassium	
		CL gm	FD gm	CL gm	FD gm	CL gm	FD gm	CL gm	FD mg	CL mg	FD mg	CL mg	FD mg
CERT'NLY CITRUS JUICE STICKS** Stop & Shop, OR-LM-LI	1.75		0.6		0.02		12.5		53		8.1		22
CHOCOLATE MOUSSE Weight Watchers, sugar free, CHOC	1.75	2	2.1	<1	0.7	9	10.0	35	54	30	33.3		124
DIET 7-UP SPOT POPS DCA Food Ind., CH	1.75	0	0	0	0.02	8	8.7	15	36	5	5.0	0	0.6
FOOD CLUB FUDGE BARS** Topco Associates, FG	2.5		2.4		1.1		23.7		114		129		326
FOOD CLUB TWIN POPS** Topco Associates, GR-CH-OR	3		0		0.03		19.7		79		6.1		1.7
FRESH LITES Dole, RP-PN/OR	1.65	<1	0.1	<1	0.04	6	6.2	25	25	11*	3.7		12.9
FROZFRUIT Frozfruit Corp., ST	4	0	0.29	0	0.06	16	16.8	70	68		9.9		23.2
FRUIT JUICE BARS Welch's, no sugar added, GR-ST-RP	1.75	0	0.06	0	0.01	6	5.3	25	22	0	2.7		10.4
FRUITSTIX Lafayette Foods, ST	4	0	0	0	0.05	15	26.8	68	108		3.1		63.4
FUDGE BARS** Haagen Dazs, CHOC	2.5		3.7		12.7		20.9		210		44.2		178
FUDGSICLE FUDGE POPS Popsicle Industries, CHOC	1.75	2	1.3	1	0.8	12	11.6	70	59	70	31.9		107
GREAT AMERICAN CHILLY POPS** Vroman Foods, CH-LM-RP	1.75		0		0.02		10.1		40		2.6		1.2
GREENS GIGGLE POPS Crowley Frozen Desserts, WM-CH-RP	1.75	0	0	0	0.01	20	10.0	80	40	5	14.3		0
HENDRIES FUDGE STIX Hendries, sugar free, FG	1.7	2	2.4	0	0.18	8	8.7	30	46	30	4.2		188
JELL-O GELATIN POPS Kraft General Foods, OR-RP-ST	1.8	1	0.5	0	0.01	8	9.0	35	38	25	14.9		0.1

Table 3. Analysis of frozen desserts and pops (continued).

Brand/Processor/Flavor	Serv. size, oz.	Protein		Fat		Carbohydrate		Calories		Sodium		Potassium	
		CL gm	FD gm	CL gm	FD gm	CL gm	FD gm	CL gm	FD mg	CL mg	FD mg	CL mg	FD mg
JELL-O PUDDING POPS Kraft General Foods, CHOC VAN	2.75	4	2.1	3	2.6	14	14.2	90	88	75	49.0		44.9
KOOL-AID KOOL PUMPS Kraft General Foods, BERRY B	2.75	1	0.85	1	0.99	16	15.7	70	75	25	18.1		21.6
LIFE SAVERS FLAVOR POPS Nabisco (H. P. Hood), CHOC-PN-LM-OR	1.75	0	0	0	0.01	10	10.1	40	40	5	3.6		0.7
LIGHT N' LIVELY NONFAT DESSERT BARS Kraft General Foods, CHOC	1.75	2	2.2	0	0.15	11	12.8	50	61	50	30.0	0	67.1
LUIGIS REAL ITALIAN ICE J & J Snack Foods Corp., CH	6	1	0	1	0.04	18	33.7	75	135		11.8		22.7
MINUTE MAID FROZEN JUICE BARS Gold Bond Ice Cream, OR-GR-CH	2.25	0	0	0	0.02	14	16.0	60	65	10	3.0		21.3
PATHMARK TWIN POPS Supermarkets General, CH-OR-GR	3	0	0	0	0.02	12	17.5	50	70	15	5.5		8.1
POP BARS** Stop & Shop, CH	1.75		0		0.01		10.4		41		2.5		0.3
POPSTIX Hendries, OR-CH-GR	1.75	0	0	0	0	10	10.3	40	41	5	2.8		0.3
SEYMOUR'S POPS Seymour's, BAN-LM-OR-RB-CH-GR	1.75	0	0	0	0.01	10	12.1	40	48	5	3		0
SUN TOP REAL FRUIT JUICE BARS Dole, FRP-LMD	1.6	<1	0.21	<1	0.04	9	9.7	40	40	5	4.5		25
SUPER JUICE FROZEN SNACKS J & J Snack Foods, OR-GR-CH	2.25	0	0	1	0.02	14	17.2	60	69	5	5.6	70	34.7
TREAT TWIN POPS** Borden, no flavors listed	2.5		0		0.03		20.7		82		11.1		1.5
TRIX POPS Vroman Foods, RP	1.75	0	0	0	0.02	10	10.3	40	41	0	3.1		4.7
TWIN POPS A & P, OR-GR-CH	3	0	0	0	0.03	17	19.0	70	76	10	8.4		3.5

Table 3. Analysis of frozen desserts and pops (continued).

Brand/Processor/Flavor	Serv. size, oz.	Protein		Fat		Carbohydrate		Calories		Sodium		Potassium	
		CL	FD	CL	FD	CL	FD	CL	FD	CL	FD	CL	FD
		gm	gm	gm	gm	gm	gm	gm	mg	mg	mg	mg	mg
ULTRA SLIM FAST Slim Fast Foods, VAN COOKIE CRUNCH	2	3	1.8	4	3.4	14	14.9	90	93	70	54.1	90	62.4
WEIGHT WATCHER'S ENGLISH TOFFEE CRUNCH BARS H. J. Heinz, VAN TOFF	1.7	2	2	8	3.5	11	11.1	120	83	45	8.9		17.2

CL = claim and FD = found per serving size

gm. = grams, mg. = milligrams, oz. = fluid ounces

* = claim for sodium content varied from 6 to 11 mg. per serving

** = no claim made for nutrients

serving size is in fluid ounces and is usually one bar or cup

Abbreviations: OR = orange, GR = grape, CH = cherry, LM = lemon, LI = lime, CHOC = chocolate, FG = fudge, RP = raspberry, PN = pineapple, ST = strawberry, WM = watermelon, VAN = vanilla, Berry B = berry blue, BAN = banana, RB = root beer, FRP = fruit punch, LMD = lemonade, TOFF = toffee

Table 4. Summary of nutrient values per serving size for frozen dessert pops.

Nutrient	No. ¹	Avg. claim (range) ²	Avg. % of claim found (range)	Avg. amount found ³	No. >20% over claim
Calories	25	55.5 (15-120)	+16.4 (-50 to +140)	66.9	5
Protein	10	2.0 gms (0-4)	-16.9 (-50 to +20)	0.7	0
Fat	7	2.7 gms (0-8)	-46.5 (-98 to -1)	0.8	0
Carbohydrates	25	11.9 gms (6-20)	+12.2 (-50 to +87)	14.2	5
Sodium	20	25.1 mg (0-75)	-25.7 (-86 to +186)	16.8	1
Potassium	2	80.0 mg (70-90)	-59.5 (-50 to -31)	44.0	1

¹ No. = only samples designating a claim greater than <1 and 0 used in calculations of average claim.

² Range of values includes values < 1 and 0.

³ 32 samples tested.