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**Fat Content
of Ground Beef
and Sausage 1989**

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

The 113 ground beef and 40 sausage samples collected in retail stores and restaurants in Connecticut during 1989 were analyzed to determine if they met Connecticut and Federal Regulations pertaining to fat and water content.

Among 57 ground beefs subject to the regulation that they contain not more than 30% fat, the average fat content was 17.2%, and none contained more than the 30% allowed. Among samples designating a specific fat content, 10 of 56 exceeded their declared amount by an average of 3.7%. Samples labeled as *ground chuck* averaged 18.9% fat, *ground sirloin* 14.2%, and *ground round* 10.9%. Samples labeled as *lean* averaged 17.4% fat and those labeled *extra*, *diet*, or *super lean*, 12.0%. None of 40 sausage products contained an excess of fat. All labeled *Italian* were within the regulated requirement that they contain not more than 35% fat, and all those not labeled as Italian sausage had less than the 50% fat permitted under the regulations. *Italian* sausage averaged 22.0% fat and those not labeled as Italian, 23.4%. One sample contained an excess amount of water.

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Ground beef and sausage must meet Connecticut Regulations which follow the Federal Regulations (Code of Federal Regulations, 1989). These have been described in detail in previous reports of analysis of ground beef and sausage (Hankin, 1989; Hankin, 1988; Hankin, 1985; Hankin and Hanna, 1983). Briefly, ground beef cannot contain more than 30% fat. If the label specifies a fat content, then the product must comply with the label claim. For example, some labels state *not less than 80% lean*. This is interpreted to mean *not more than 20% fat* (Administrative Regulations). If excess fat is found, then the product is misbranded (General Statutes, 1989). The terms *lean*, *extra lean*, and *diet* or *super lean* imply a lower fat content, but no Connecticut Regulations relating these terms to fat content were in effect in 1989. The same holds true for products labeled as *ground chuck*, *sirloin*, or *round*. In 1990 new regulations, described below, pertaining to the labeling of ground beef went into effect (Regulations 1990).

Sausage cannot contain more than 50% fat. Sausage labeled as *Italian* cannot contain more than 35% fat. All types of sausage cannot contain more than 3% water, usually added as ice to facilitate chopping or mixing (Code of Federal Regulations, 1989).

METHODS

Samples were collected from January 1, 1989 through December 31, 1989 by inspectors of the Food Division of the Connecticut Department of Consumer Protection. In all, 113 ground beef and 40 sausage samples were purchased and tested. Most samples were from retail stores, but a few were from restaurants and fast food outlets. Unless the label claimed a lower fat content, samples of ground beef were considered to be regular ground beef and subject to the regulation that they contain not more than 30% fat. Sausage was considered subject to the regulation that the product contain not more than 50% fat unless the label specifically indicated that it was

Italian sausage and thus subject to the regulation that it contain not more than 35% fat. No beef sausage was tested but a few miscellaneous products other than ground beef and sausage were tested.

Samples were delivered to the laboratory and either tested immediately or frozen until tested. Analyses were performed by methods described in Official Methods of Analysis (1984). Fat is expressed as percentage of the finished product that was purchased.

Beef and pork contain muscle and connective tissue as well as fat. When beef is ground, the product is particulate rather than homogeneous. Thus, there is some variability among samples. Because of this inherent variability, duplicate analyses for fat are always made and the results averaged. We found an average difference of one percentage unit between duplicates with a standard deviation about their mean of 0.9 percentage units. Because of the inherent variability in sampling and in analysis, only samples found to be greater than one percentage unit above the regulated standard or above the claim stated on the label were considered to contain an excess of fat.

RESULTS AND DISCUSSION

Ground Beef: In Table 1 the fat contents of the 113 ground beefs tested, expressed as percentage of fresh weight of the finished product, are listed by vendor or manufacturer. Following the name of the vendor is the town where the merchant or restaurant is located. The percentage of fat, with those having an excess of fat, is followed by a plus sign (+). If a specific claim for fat was made it is shown followed by any declaration pertaining to a cut of meat or designation, such as *lean*, *extra lean*, or *diet lean*, implying lower fat content.

Among 113 ground beefs tested, 57 did not specify a fat content and thus were subject to the regulation that they contain not more than 30% fat. These 57 ground beefs averaged 17.2% fat (Table 2).

Also among the ground beefs were some labeled as *lean*, *extra lean* or *diet lean* to imply a lower fat content, and some labeled *ground chuck*, *ground sirloin*, or *ground round* to show cut of meat used. Samples labeled as *lean* averaged 17.4% fat, and those labeled as *extra*, *diet* or *super lean* 12.0% fat. Samples labeled *ground chuck* averaged 18.9% fat; *ground sirloin*, 14.2% fat; and *ground round*, 10.9% fat. Products only specifying a cut of meat or implying lower fat content need only meet the requirement that the meat contain not more than 30% fat.

None of the 57 samples not claiming a fat content exceeded the standard of 30% (Tables 1 and 2). On the other hand, 10 of 56 claiming a fat content less than 30% exceeded their claim. For these 10 samples containing an excess of fat, the average excess was 3.7%, with a range from 1.1 to 7.5%.

A comparison of conformity to regulated or claimed fat content in the 1989 sampling with our sampling in 1982-1983, 1985, 1987 and 1988 is shown in Table 3. In all surveys, including the present one, few or none of samples not claiming a fat content had an excess of fat. For all samples the percentage of samples with an excess of fat remained fairly steady, but for those designating a fat content the percentage with an excess of fat declined by over two-fold in six years.

Sausage: The fat contents of the 40 sausages, expressed as percentage of fresh weight of the finished product, are listed in Table 4. The percentage of fat found is then shown, and those with an excess of water are followed by a # sign. Any label declaration follows. Twenty nine were designated as Italian sausage and subject to the 35% fat maximum allowance. Those without a label declaration and those not specifically designated as Italian are considered to be regular sausage and subject to the 50% fat maximum allowance.

All sausage products met the requirements for maximum allowable fat. The average percentage of fat among all products was 29.8%. Sausage not specifically labeled as *Italian* or with no label designation averaged 23.4% fat with a range from 4.3 to 46.9%. *Italian* sausage averaged 22.0% with a range from 12.4 to 32.5%. One sample contained excess water.

Miscellaneous products: In addition to the ground beef and sausage, 13 miscellaneous products were collected and tested for fat content. These included ground turkey, frankfurters, ground pork, ground veal, and roast beef. Results of analysis are listed in Table 5. Only one sample of ground turkey exceeded the fat content declared.

After the samples reported in this Bulletin were tested and results reported to the Connecticut Department of Consumer Protection, new regulations were formulated and put into effect by the Department pertaining to the

maximum amount of fat allowed in different categories of ground beef (Regulations 1990). These regulations are shown in Table 6, together with the percentage of 1989 samples that would not have met the new standards, if they had been in effect. As noted in Table 6, from 0 to 50% of samples in any one category would not have met the new regulations. Overall, 25% of samples within the specific categories would have been listed as containing an excess amount of fat.

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Table 1. Fat Content of Ground Beef.

Vendor	Town	found	Fat, % claimed	Label declaration
A & P	Farmington	18.3		chuck
A & P	Farmington	14.8		round
A & P	Farmington	21.5		
A & P	Farmington	13.4		sirloin
A & P Supermarket	Danielson	17.0	23	chuck patties
A & W Restaurant	Farmington	20.5		
Bell Vending	Glastonbury	21.7		
Big Y/Greenfields	Torrington	22.3	25	75% lean
Big Y Shop Rite	Norwich	11.0	10	90% lean
Bonanza	Norwich	27.3		
Burger King	Manchester	26.0		
Chilis	Newington	24.8		
City Beef	Hartford	17.1		
David's Place	Montville	17.7		
East Center Market	Wallingford	18.9		chuck, lean
Edward's Food Warehouse	Enfield	10.9	10	90% lean
Edward's Food Warehouse	Manchester	11.4	16	84% extra lean
Edward's Food Warehouse	Manchester	17.3	22	78% lean
Elm City Diner	New Haven	21.6		
Everybody's Market	New Haven	18.6		lean
Finast	East Hartford	15.5	16	87% extra lean
Finast	East Hartford	27.3	28	72% lean
Finast	Putnam	10.4	10	90% lean
Finast Supermarket	Wallingford	16.1	16	extra lean, 16% fat
First National Supermarket	Orange	11.6 *	10	90% diet lean
First National Supermarket	Orange	13.1 *	10	90% diet lean
First National Supermarket	Orange	8.3	10	90% diet lean
First National Supermarket	Orange	18.3	22	78% lean
First National Supermarket	Orange	17.5		72% lean
Food Emporium	Westport	20.0		
Food Emporium	Westport	14.5		chuck
Food Emporium	Westport	15.4		sirloin
Friendly Restaurant	Farmington	22.8		patties
Goldberger Foods	Minneapolis, MN	26.0		sirloin patties
Grade A Market	Stamford	14.8		round
Grade A Market	Stamford	17.8		chuck
Gran Central Market	Bridgeport	10.3		sirloin patties
Gran Central Market	Bridgeport	7.1		round
Gran Central Market	Bridgeport	12.0		chuck
Grand Union	Fairfield	10.5	15	85% extra lean
Grand Union	Fairfield	9.5	10	90% diet lean
Grand Union	Ridgefield	13.8 *	10	sirloin, 90% lean
Grand Union	Ridgefield	9.0		extra lean
Heartland Food Warehouse	Vernon	12.5	15	85% lean
Heminway's	Watertown	24.0		low fat hamburger
Joe's American Bar & Grill	West Hartford	16.1		
LaBonne's Epicure	Farmington	8.0		round
LaBonne's Epicure	Farmington	22.4		chuck
LaBonne's Epicure	Farmington	15.6		chuck, lean
McDonald's	Colchester	21.8		

Table 1. Fat Content of Ground Beef (continued).

Vendor	Town	Fat, % found	Fat, % claimed	Label declaration
Meat Town	Plainville	11.3		round
Meat Town	Plainville	24.0		chuck
Meat Town	Plainville	18.8		sirloin
Pathmark	Danbury	11.0		round
Pathmark	Danbury	9.0	10	sirloin, 90% lean
Pegson and Paulgard	Branford	9.3		chuck
Prime Market	New Haven	17.5		chuck
Shady Glen	Manchester	17.5		
Shop Rite	Bloomfield	17.8 *	12	sirloin, 80% lean
Shop Rite	Bloomfield	15.8	20	80% lean
Shop Rite	Bloomfield	7.6	15	85% lean
Shop Rite	Bristol	14.5		sirloin
Shop Rite	Bristol	20.1	20	chuck, 80% lean
Shop Rite	Bristol	8.6	15	round, 85% extra lean
Shop Rite	Brookfield	19.8	20	80% lean
Shop Rite	Brookfield	14.6	15	85% extra lean
Shop Rite	Torrington	21.4	27	73% lean
Shop Rite	Willimantic	9.9	13	87% lean
Shop Rite	Willimantic	13.8 *	12	super lean
Shop Rite	Willimantic	19.0	20	80% lean
Signature Foods	Omaha, NE	17.3	20	80% fat free
Signature Foods	Omaha, NE	13.6	15	85% fat free
Signature Foods	Omaha, NE	9.3	10	90% fat free
Stafford Co-op	Stafford Springs	13.0		round, extra lean
Stafford Co-op	Stafford Springs	28.2		chuck
Stop & Shop	Branford	12.4		extra lean
Stop & Shop	Branford	21.8		lean
Stop & Shop	Enfield	18.7		lean
Stop & Shop	Groton	22.4		lean
Stop & Shop	Hartford	12.3		sirloin
Stop & Shop	Hartford	11.0		extra lean
Stop & Shop	Norwich	21.6		chuck
Stop & Shop	Wallingford	19.8		lean
Stop & Shop Supermarket	Willimantic	13.0		extra lean
Stop & Shop Supermarket	Willimantic	18.3		lean
TOPS Supermarket	Plantsville	19.3		chuck
TOPS Supermarket	Plantsville	9.3		round
Valu Warehouse Foods	Bridgeport	7.9		round
Valu Warehouse Foods	Bridgeport	6.0		sirloin
Valu Warehouse Foods	Bridgeport	18.4		chuck
Waldbaum's	Bloomfield	18.8 *	13	sirloin, 13% fat
Waldbaum's	East Haven	11.4	13	13% fat
Waldbaum's	Farmington	10.0	17	extra lean, 17% fat
Waldbaum's	Farmington	11.0	28	28% fat
Waldbaum's	Farmington	9.6	23	lean, 23% fat
Waldbaum's	Farmington	7.4	13	sirloin, 13% fat
Waldbaum's	Groton	25.9 *	23	chuck, lean, 23% fat
Waldbaum's	Groton	23.0	23	23% fat
Waldbaum's	Newington	21.1	23	lean, 23% fat
Waldbaum's	Newington	20.3	28	28% fat

Table 1. Fat Content of Ground Beef (continued).

Vendor	Town	Fat, % found	Fat, % claimed	Label declaration
Waldbaum's	Newington	16.1	17	extra lean, 17% fat
Waldbaum's	Newington	20.5 *	13	sirloin, 13% fat
Waldbaum's	Newington	12.4	13	sirloin, 13% fat
Waldbaum's	Norwalk	23.6		lean, <23% fat
Waldbaum's	Norwalk	20.3 *	17	extra lean, <17% fat
Waldbaum's	Norwalk	10.0	13	sirloin, 13% fat
Waldbaum's	Norwalk	14.1	17	round, extra lean, 17% fat
Waldbaum's	Southington	8.0	13	13% fat
Waldbaum's	Southington	19.9	23	lean, 23% fat
Waldbaum's	Southington	14.1 *	13	sirloin, 13% fat
Waldbaum's	Southington	21.3	28	28% fat
Waldbaum's	Southington	16.3	17	extra lean, 17% fat
Wendy's Old Fash. Hamburgers	Hartford	25.3		

Table 2. Average amount of fat in categories of ground beef.

Type	Number samples	% Fat	Range
Regular ground beef ^a	57	17.2	7.1-27.3
Lean	30	17.4	9.0-25.9
Extra, super, or diet lean	21	12.8	8.3-16.1
Ground chuck	17	18.9	9.3-28.2
Ground sirloin	15	14.2	6.0-26.0
Ground round	11	10.9	7.1-14.8

^a Samples subject to 30% fat allowance even though they had a label declaration showing cut of meat or implying lower fat content.

Table 3. Comparison of analyses of fat in ground beef, 1989, 1988, 1987, 1985, and 1982-83

Type	1989 No. samples (% excess)	1988 No. samples (% excess)	1987 No. samples (% excess)	1985 No. samples (% excess)	1982-83 No. samples (% excess)
Regular	57 (0)	68 (0)	71 (0)	115 (0)	155 (1.9)
Fat specified	56 (17.9)	103 (16.5)	52 (21.2)	61 (22.9)	48 (41.7)
All samples	113 (8.8)	171 (9.9)	123 (8.9)	176 (8.0)	203 (11.3)

% excess indicates percentage of samples with an excess amount of fat

Table 4. Fat content of sausage.

Vendor	Town	% fat found	Label declaration
A & P Supermarket	Danielson	19.0	pork, sweet
A & P Supermarket	Danielson	22.0	pork
Beit Bros. Supermarket	Uncasville	25.3	Italian, hot
D & D Market	Hartford	4.3	
DeYulio Sausage Co.	Stamford	22.6	Italian
DeYulio Sausage Co.	Stamford	26.0	Italian
Edward's Food Warehouse	Enfield	23.0	Italian, pork, sweet
Elm Brand	New Haven	32.5	pork, fresh
Everybody's Market	New Haven	15.7	Italian, sweet
Food Emporium	Westport	17.5	Italian, sweet
Grand Union	Fairfield	21.9	Italian, pork, sweet
Grand Union	Ridgefield	22.3	
Grand Union	Ridgefield	23.9	Italian, hot
Heartland Food Warehouse	Vernon	20.5	
Heartland Food Warehouse	Newington	27.5	Italian, hot
Heartland Food Warehouse	Newington	17.4	Italian, sweet
Heartland Food Warehouse	Newington	35.3	breakfast
LaBonne's Epicure	Farmington	15.0	veal, diet lean
LaBonne's Epicure	Farmington	25.3	Italian, sweet
LaBonne's Epicure	Farmington	30.9	Italian, hot
Lewis Beef	Springfield, MA	46.9	links
Meat Town	Plainville	23.6	Italian, sweet
Meat Town	Plainville	20.9	Italian, hot
Noel's Market	Gales Ferry	22.8	Italian, sweet
Pathmark	Danbury	22.8	Italian, sweet
Perri's	New Haven	25.6	Italian
Prime Market	New Haven	17.5	Italian
Primo	New Haven	24.0	sweet
Shop Rite	Brookfield	27.6	Italian, hot
Stop & Shop Supermarket	Willimantic	21.3	Italian, sweet
TOPS Supermarket	Plantsville	14.8	Italian, sweet
TOPS Supermarket	Plantsville	12.4	Italian, hot
Valu Warehouse Foods	Bridgeport	21.0 #	Italian, sweet
Waldbaum's	Norwalk	23.0	Italian, sweet
Waldbaum's	Wallingford	15.9	
Waldbaum's	Southington	23.0	Italian, sweet
Waldbaum's	Southington	17.4	Italian, hot
Waldbaum's	Farmington	25.4	Italian, sweet
Waldbaum's	Newington	21.1	Italian, hot
Waldbaum's	New Haven	19.3	Italian

This sample contained an excess of water.

Table 5. Fat content of miscellaneous types of products.

Vandor	Town	% fat found	Label declaration
Arby's	Waterford	8.3	roast beef
Arby's	Windsor	8.8	beef for roasting, raw, 12% fat
Grote and Weigel	Bloomfield	25.1	frankfurter, jumbo size
Grote and Weigel	Bloomfield	23.3	frankfurter
Hebrew National	Bronx, NY	14.4	frankfurter, beef, 83% fat free
Kahns	Cincinnati, OH	4.0	pastrami, Lite Sensations
Perdue Farms	Salisbury, MD	9.9 *	ground turkey, 93% fat free-7% fat
Perdue Farms	Salisbury, MD	6.8	ground turkey, 93% fat free-7% fat
Perdue Farms	Salisbury, MD	5.6	ground turkey, 93% fat free-7% fat
Perdue Farms	Salisbury, MD	6.4	ground turkey
Shady Brook Farms	Dayton, VA	5.6	ground turkey
Waldbaum's	Southington	22.7	ground pork
Waldbaum's	Southington	11.0	ground veal, Light 'N Lean

* This sample contained excess fat.

Table 6. New regulations for 1990 for the labeling of ground beef.

Category	Maximum % fat allowed allowed	% of 1989 Samples not meeting new regulations
Lean	22	14
Extra lean	15	25
Diet lean	10	50
Ground chuck	20	29
Ground round	15	0
Ground sirloin	13	47



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