

Fatty Acid Composition of Fats Extracted from Meat and Cheese Pizza

TOTAL AND PROPORTIONAL consumption of fats has reached an all-time peak with the average diet in the United States containing 40% of its calories as fat. The kinds and amounts eaten are of interest to economists, consumers, and scientists. In the study reported here, fats extracted from eleven varieties of pizza have been assayed for individual fatty acids.

Pizzas were prepared using two popular recipes, two shelf mixes, two refrigerated mixes (with addition of cheese or meats), one shelf mix with additions, and four commercially-frozen pizzas.

The homemade cheese pizza was made using $\frac{1}{2}$ package dry yeast, 1 tbsp shortening, $\frac{5}{8}$ tsp salt, $1\frac{3}{4}$ c flour, 1 tsp salad oil, $\frac{1}{8}$ c onions, $9\frac{1}{2}$ oz tomatoes, 4 oz tomato sauce, $\frac{1}{2}$ bay leaf, $\frac{1}{2}$ tsp sugar, $\frac{1}{2}$ tsp oregano, dash of pepper, 1.8 oz cheddar and 0.7 oz parmesan cheese. The homemade sausage pizza contained the same ingredients except it contained only 1.4 oz cheddar cheese and $\frac{1}{2}$ lb of pork sausage which had been sauteed and drained.

Pizzas made of shelf mixes were prepared by the directions on the package. The cheese shelf mix with additions had a sauce added to each pizza which was made with 4 oz tomato paste, $\frac{1}{2}$ lb ground beef, $\frac{1}{2}$ tsp oregano, $\frac{1}{2}$ tsp salt, and a dash of worcestershire sauce and pepper. The refrigerated mix with cheese had 1.6 oz cheddar cheese and 1.4 oz parmesan cheese added. The refrigerated mix with meat has $\frac{1}{2}$ lb ground beef (sauteed and drained) and 1.8 oz cheddar cheese added for each pizza.

All pizzas were prepared in duplicate. Fat was extracted by the Method of the Association of Official

Agricultural Chemists (1). Methyl esters were prepared and subsequently assayed by gas chromatography by a previously published procedure (2).

The percentage of fat and the fatty acid composition of the pizzas are presented in Table I. Fat extracted from four different types of cheese pizza was found to contain average amounts of 34% oleic acid and 16% linoleic acid. The mean values of the fats extracted from the meat pizzas were 40% oleic acid and almost 10% linoleic. This decrease in linoleic and increase in oleic would be expected since the meats used were of beef and pork origin and would be high in oleic and low linoleic acid. The frozen cheese pizza contained only 8.6% linoleic. There was a general tendency for the linoleic acid to be less in the commercially-frozen pizzas.

Minute quantities of fatty acids with eight carbons survived the cooking. Larger quantities of acids containing 10, 12, and 14 carbons were present. Both the cheese and meat pizzas contain over 27% palmitic acid.

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REFERENCES

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[Received June 12, 1967]

TABLE I
Fat and Individual Fatty Acid Composition of Several Types of Pizzas

Type of pizza	Ingredients added	% fat	Carbon chain length: number of double bonds									
			8:0	10:0	12:0	14:0	14:1	16:0	16:1	18:0	18:1	18:2
CHEESE:												
Frozen	None	5.7	1.9	2.5	2.8	9.2	3.0	31.0	3.3	8.8	28.6	8.6
Shelf mix	Water, shortening	7.3		1.0	1.0	5.6		25.2		7.8	37.3	22.3
Refrigerator mix	Cheddar & Parmesan cheese	9.9		1.0	1.4	7.4		28.6	2.4	10.6	35.0	14.3
Homemade	Water, yeast, shortening, salt, flour, salad oil, onions, tomatoes, tomato sauce, bay leaf, sugar, oregano, pepper, cheddar & Parmesan cheese	6.7	0.8	1.4	1.2	6.6	0.4	25.8	0.8	9.8	35.0	19.0
Average for cheese pizzas			0.7	1.5	1.6	7.2	0.8	27.6	1.6	9.2	34.0	16.0
MEAT:												
Frozen sausage	None	7.4	1.0	1.5	1.5	6.0	1.2	27.0	3.6	12.2	35.7	9.6
Frozen pepperoni	None	10.0		1.0	0.8	4.8		25.4	2.2	11.6	45.0	9.0
Frozen hamburger	None	6.4		1.4	1.6	8.6	0.8	31.2	2.6	12.6	34.2	6.0
Shelf mix sausage	Water, shortening	7.6				3.6		28.6	2.6	13.1	43.6	9.1
Refrigerator mix	Ground beef and Cheddar cheese	13.7				5.6	1.2	27.5	4.0	10.1	42.2	8.8
Cheese shelf mix with additions	Tomato paste, ground beef, oregano, pepper, and worcestershire sauce	7.7				6.6		28.0	1.9	10.6	40.6	12.4
Homemade sausage	Same as homemade cheese with pork sausage added	9.8	1.5	1.2	1.4	5.2		26.0	3.2	11.2	36.9	14.0
Average for meat pizzas			0.4	0.7	0.8	5.8	0.4	27.7	2.9	11.6	39.7	9.8