

EFFECT OF COOKING METHOD ON THE CHOLESTEROL CONTENT OF HAMBURGER PATTIES

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Story in Brief

Cooking hamburger patties on an Instant Burger Cooker did not result in any appreciable reduction in the cholesterol content. Even though the fat content of some hamburger brands decreased slightly their cholesterol level showed an increase suggesting that cholesterol may also be present in the structural lipids (intracellular membranes and structures) in addition to external and intramuscular fat.

(Key words: Cook method, cholesterol, hamburger.)

Introduction

Animal tissues contain a great variety of steroids of which cholesterol is quantitatively the most important. It is a constituent of all body tissues and therefore appears to be necessary for the integrity of the animal cell. Man derives his cholesterol stores by two processes, by endogenous synthesis and by absorption of dietary cholesterol. Since it is a universal constituent of all animal cells, cholesterol occurs in all foods of animal origin.

Cholesterol is involved in the organization and permeability of cell membranes. Progestagens, glucocorticoids, mineralocorticoids, androgens and estrogens are the major steroid hormones derived from cholesterol. It is a precursor of vitamin D which is important in the control of calcium and phosphorus metabolism. Reduction in blood cholesterol levels by dietary means is difficult under conditions consonant with good nutrition. The daily intake of cholesterol in the mixed diet of an adult varies from 200 to 360 mg.

In spite of many useful roles played by cholesterol in the human body, a school of thought exists that diets of animal origin high in cholesterol are responsible for certain cardiovascular diseases. Even though the average cholesterol content of cooked meats is less than 100 mg/ 100g, the increasing consumption of fast foods necessitates a closer look at the cholesterol levels in these foods. Janciki and Appledorf (1974) reported a decrease in the cholesterol content of beef patties broiled or grill fried compared to raw ones while microwave cooking had no effect. However, they noticed no significant difference between cooking methods.

This investigation was undertaken to determine whether a new type of cooker (Instant Burger) affected the cholesterol content of cooked hamburger when compared to a conventional grill.

Materials and Methods

Hamburger patties each weighing approximately 4 oz (raw) were obtained from two local fast food outlets (Brands B and C) and from OSU

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food service center (Brand A). All the patties after wrapping in wax coated paper were packaged in freezer paper and stored at -10 C.

The fast food outlets also provided cooked patties. The raw Brand A patties were cooked on an electrical griddle preheated to 350 F, to medium well degree of doneness. This constituted the conventional cooking method. The cooked patties were wrapped in freezer paper and stored at -10 C.

Cooking the patties using the Instant Burger (Smokaroma Inc. Boley O.K. 74829) was the new method of cooking. Two patties were cooked at a time to medium well done. The cooked patties were transferred on to a wax coated paper, wrapped and stored in a freezer at -10 C along with all other cooked patties until analysis (not more than a week).

Chemical analysis: The patties were analyzed for protein, ether extract and moisture following the AOAC methods (1980).

Cholesterol determination: The cooked patties were ground through a 1/8 in plate of a hand grinder and 2 g were weighed into a stainless steel container attachment of a Sorvall Omnimixer. Crude fat was extracted with a chloroform methanol mixture 2:1 by volume (Hubbard et al. 1977). The chloroform extract was evaporated to dryness using a water bath at 60 C with a thin stream of air flowing over the sample and finally dried to a constant weight in a hot air oven at 60 C. The dried fat was redissolved in ethyl ether to known volume and 1 ml was pipetted into a clean test tube and once again dried at room temperature (about 25 C). Cholesterol was determined spectrophotometrically using o-phthalaldehyde reagent (Bachman et al. 1976). The results were expressed as mg cholesterol per 100 g of sample.

Results and Discussion

Brand A burgers (Table 1) showed a moderate increase in the cholesterol level due to Instant Burger cooking even though their fat content was slightly decreased. The Brand B patties (Table 1) had a slight increase in the cholesterol level and a slight decrease in the fat content when cooked on Instant Burger. The Brand C patties (Table 1) cooked on the Instant Burger had a moderate decrease in their cholesterol

Table 1. Chemical composition and cholesterol values of hamburger patties cooked by Instant Burger and Conventional methods

Sample #	Instant Burger cooked				Griddle cooked			
	Pro %	Mois %	Fat %	Chol mg/100g	Pro %	Mois %	Fat %	Chol mg/100g
Brand A	24.9	58.8	14.8	27.06	26.5	53.9	17.0	22.53
Brand B	24.6	59.2	15.6	30.44	28.1	54.5	17.0	28.84
Brand C	23.6	59.5	16.6	27.58	26.4	47.5	26.5	33.43
Average (54 patties)	24.4	59.2	15.7	28.48	27.0	52.0	20.2	28.3

value and a moderate decrease in the fat content. These results are not in general agreement with Janciki and Appledorf (1974) who reported that the method of cooking, broiling, grill frying or microwave cooking, had no significant effect on the cholesterol content of cooked beef patties.

Brand C patties conventionally cooked had 26.5 % fat and those cooked on Instant Burger had 16.6 % fat (Table 1). This increased loss of fat from Brand C patties on Instant Burger cooking may be responsible for their low cholesterol values compared to conventionally cooked ones. The conventionally cooked Brand A patties (Table 1) had an average fat content of 17.0 % while the same patties cooked on Instant Burger showed an average fat content of 14.8 %. Similarly the Brand B (Table 1) conventionally cooked and Instant Burger patties had a fat content of 17.0 and 15.6 percent respectively. Even though the fat content of Brand A and Brand B decreased slightly, their cholesterol levels showed an increase which suggested that cholesterol may also be present in the structural lipids (intracellular membranes and structures) in addition to the external and intramuscular fat which is in agreement with Rhee et al. (1982).

When the data were summarized (54 patties per cooking method) from all samples (Table 1) it was observed that the cholesterol level of the cooked patties did not differ greatly due to the method of cooking. Even though the patties cooked by the Instant Burger unit contained less fat (15.7 %), the cholesterol level was not greatly different from the patties cooked by the conventional method although their fat content was much higher (20.2 %). Patties cooked on the Instant Burger possessed more moisture but less protein than patties cooked by the conventional method. Therefore it may be concluded that the cholesterol type lipids are also present within the lean portion of the ground beef patties and not directly related to the total fat content of the cooked patties.

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