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For the health professional

Lean Meats can be Part of a Lipid-Lowering Diet

Diet intervention is recommended as first-line therapy for the management of high blood cholesterol levels.[1-4] The Canadian Consensus and the National Cholesterol Education Program (NCEP) both advocate similar basic dietary guidelines for reducing cholesterol levels, as outlined in Table 1.

Dietary compliance is one of the challenges health professionals encounter when counseling patients on lipid-lowering diets. The goal of diet therapy is to reduce elevated serum cholesterol levels while maintaining an eating pattern that is varied, balanced and nutritionally adequate.

Patients often cite limited food choices and elimination of favourite foods as reasons for not following cholesterol-lowering diets. Conventional lipid lowering diets often eliminate red meats or permit only very small amounts, which many people find unacceptable.[5,6]

Limited availability of lean meat has precluded their incorporation into diets designed to reduce serum cholesterol levels. However, feeding and breeding practices of livestock and retail trimming of fat have changed over the last twenty years, and today's lean cuts of meat contain the same or just slightly more fat than poultry and fish.

The recent production of lean pork has resulted in a fat content 42-47% lower than traditional pork.[7] All pork cuts today when trimmed of visible fat, with the exception of ribs, meet the government's definition of lean contains less than 10% fat. The availability of lean pork cuts will potentially increase the number and variety of meat choices available.

Studies have demonstrated low-fat diets including lean meat (pork, beef, lamb and veal) can be as effective in reducing blood lipid levels as low-fat diets including poultry or fish.[5, 8-12] In a recent study, 191 adults with hypercholesterolemia followed an NCEP Step I diet with no more than 30% of calories from fat but included 170g (6 oz) of lean meat per day, 5 to 7 days a week. One group consumed lean red meat (pork, beef, and veal) and the other group consumed lean white meat (poultry and fish). Both groups produced similar reductions in low-density lipoprotein cholesterol and elevations in high-density lipoprotein cholesterol levels, which

Table 1. Dietary Guidelines for Reducing Cholesterol Levels.

Nutrient	Recommended Intake
Total Fat	<30% of total calories
Saturated Fat	8%-10% of total calories
Polyunsaturated Fat	up to 10% of total calories
Monounsaturated Fat	up to 15% of total calories
Carbohydrates	50%-60% of total calories
Protein	10%-20% of total calories
Cholesterol	<300mg/day
Total Calories	Appropriate levels of caloric intake to reduce or maintain a desirable weight.

Adapted from the Canadian Consensus Conference on Cholesterol[1] and the National Cholesterol Education Program Expert Panel's second report[2]

KEY REFERENCES

1. The Canadian Consensus Conference on the Prevention of Heart and Vascular Disease by Altering Serum Cholesterol and Lipoprotein Risk Factors. Canadian Consensus Conference on Cholesterol: Final Report. March 1988, The Government Conference Centre, Ottawa, Canada.
2. Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults. Second Report on the Expert Panel on Detection, Evaluation, and Treatment of High Blood cholesterol in Adults (Adult Treatment Panel II). 1993, US Dept of Health and Human Services publication NIH 93-3095.
8. Davidson MH, Hunninghake D, Maki KC, PO Kwiterovich & S Kafonek. Comparison of the Effects of Lean Red Meat vs Lean White Meat on Serum Lipid Levels Among Free-Living Persons with Hypercholesterolemia. Arch Intern Med. 159:1331-1338, 1999.
9. Keenan JM & Morris DH. Hypercholesterolemia: Dietary advice for patients regarding meat. Postgrad Med. 98(4):113-128, 1995.

Complete reference list available.

were maintained throughout the 36 weeks of treatment.[8]

Researchers at Duke Universtiy[10] evaluated the effectiveness of lean pork versus lean chicken in the dietary management of hypercholesterolemia. Subjects were randomly assigned to one of two diets, both providing 25% calories as fat. Meat in the diet (10oz raw meat/2000Kcal) was provided exclusively as either skinless chicken or lean pork. After 28 days, those who consumed lean pork experienced a 6.8% and 7.1% decrease in total and LDL cholesterol, respectively. In the skinless chicken group, total and LDL cholesterol dropped 7.6% and 8.0% respectively. The results demonstrated that lean pork can be used as successfully as chicken in a low-fat diet to lower total and LDL cholesterol.

The blood cholesterol-raising potential of meat products appears to be a function of their fat and cholesterol contents. To reduce total and saturated fat intakes, many people think they have to substitute chicken for pork. However, the average saturated fat content of the leanest cuts of pork (based on a 85g or 3oz serving) is only 1.1g.[13] About a third of pork's saturated fat comes from stearic acid[14], which has little effect on cholesterol levels.[15] Of the remaining total fat, over half is monosaturated.[13] Table 2 shows the energy and lipid composition of commonly eaten meat, poultry and fish.

A total diet perspective should be taken when advising patients on sources of dietary fat and dietary modifications. Many other foods besides meat contain fat. In fact, 81% of the dietary fat in the average Canadian diet comes from other sources other than meat.[16]

In 1996, fresh meat (pork, beef, veal and lamb) provided 7.1% of the dietary fat in the average Canadian diet. Whereas the Other Foods, such as snack foods, chips, cookies, chocolates, as well as fats and oils provided 42% of dietary fat in the average Canadian diet.[16] These statistics demonstrate that understanding sources of dietary fat in the Canadian diet is important for making dietary recommendations and dietary changes to reduce total and saturated fat intakes.

Common practice of advising patients to avoid or severely restrict lean meat intake is unnecessary and deprives patients of the valuable nutrients found in meat. Lean meats are an important dietary source of high-quality protein, vitamins (especially the B vitamins), and minerals, such as zinc and iron. Today's meats fit well within a lower fat diet when no more than 30% of total calories are from fat as encouraged by the Nutrition Recommendations for Canadians.[17]

Table 2. Energy and Lipid Composition of Common Animal Foods

Meat Per 85-gram (3 oz) cooked, trimmed or skinless	Calories (Kcal)	Total Fat(g)	SF (g)	MF (g)	PF (g)	Cholesterol (mg)
Pork Tenderloin	138	3.1	1.1	1.2	0.3	58
Pork Loin Centre Cut*	156	5.8	2.1	2.6	0.5	67
Pork Leg Inside Round	137	3.5	1.2	1.6	0.3	74
Chicken Breast*	140	3.0	0.9	1.1	0.7	72
Chicken Leg, meat	162	7.2	1.9	2.6	1.7	80
Chicken Thigh, meat	147	6.3	1.8	2.4	1.4	81
Egg (whole), 1 large	75	5.0	1.5	1.9	0.7	216
Beef Hip Inside Round	164	5.9	2.0	2.3	0.3	57
Beef Tenderloin	179	8.8	3.3	3.4	0.4	57
Veal Retail Composite	167	5.6	1.6	2.0	0.5	100
Lamb Retail Composite	175	8.1	2.9	3.5	0.5	78
Salmon, Sockeye	184	9.3	1.6	4.5	2.0	74
Tuna, light, canned in water	111	0.4	0.1	0.1	0.1	15

SF = Saturated Fat, MF = Monounsaturated Fat, PF = Polyunsaturated Fat *boneless; Source: Canadian Nutrient File, 1997

Including Meat in Diet Therapy to Reduce Blood Lipids:

- Low fat diets that include lean meat are as effective in lowering blood cholesterol levels as chicken or fish.
- Incorporation of lean meats, such as pork loin or leg, allows for greater range of food choices, which may improve patient acceptance and long-term dietary adherence.
- Select lean cuts of meat (leg or loin), white meat from poultry and fish, and trim all visible fat and remove skin.
- Control portion size. Two 3-oz servings or less (up to 5-6 oz) per day of lean meat, poultry, or fish.
- Use low-fat cooking methods, such as steaming, baking, broiling, roasting, or grilling.
- Herbs, spices, salsas and fruit chutneys provide great flavour without added fat.
- Many other foods besides meat contain fat and the contribution of meat to total fat, saturated fat, and cholesterol intake must be evaluated from a total-diet perspective.

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