

## Nutrition Research Brief

### Beef's Contribution to Nutrient Intake in the American Diet

Summation of the following peer-reviewed manuscripts:

Nutrient contribution of total and lean beef in diets of U.S. children and adolescents: National Health and Nutrition Examination Survey 1999-2004. O'Neil CE, et al.

Lean beef contributes significant amounts of key nutrients to the diets of U.S. adults: National Health and Nutrition Examination Survey 1999-2004. Zanovec M, et al.

#### Overview:

These two studies examined the nutritional contribution of total beef and lean beef to the diet of U.S. children, adolescents and adults. Twenty-four hour dietary recall data from children 4-8 years of age (y) (n = 2,474) and 9-13 y (n = 3,273), adolescents 14-18 y (n = 4,044), and adults 19-50 y (n = 7,049) and 51+ y (n = 6,243) participating in the National Health and Nutrition Examination Survey (NHANES) 1999-2004 were assessed. The U.S. Department of Agriculture's (USDA) definition of lean beef, defined in *MyPyramid* as beef with  $\leq 9.28$  grams [g] fat/100 g, was used to determine the lean portion of all beef consumed. Results show consumption of total and lean beef contributed significantly to intake of protein and many key nutrients such as vitamins B6 and B12, zinc, iron, niacin, phosphorus, and potassium without providing significantly to intakes of total fat, saturated fatty acids, or sodium in diets of a nationally representative sample of the United States.

#### Background:

Beef is a nutritionally complete protein and provides significant quantities of B vitamins as well as trace minerals. A 3-ounce serving of beef provides 37% of the Daily Value (DV) of vitamin B12, 38% DV for zinc, 14% DV for iron and 51% DV for protein. The objective of these studies was to examine the nutritional contribution of total beef and lean beef to the American diet using the USDA definition of lean beef as defined in *MyPyramid*.

#### Experimental

##### Design/Methodology:

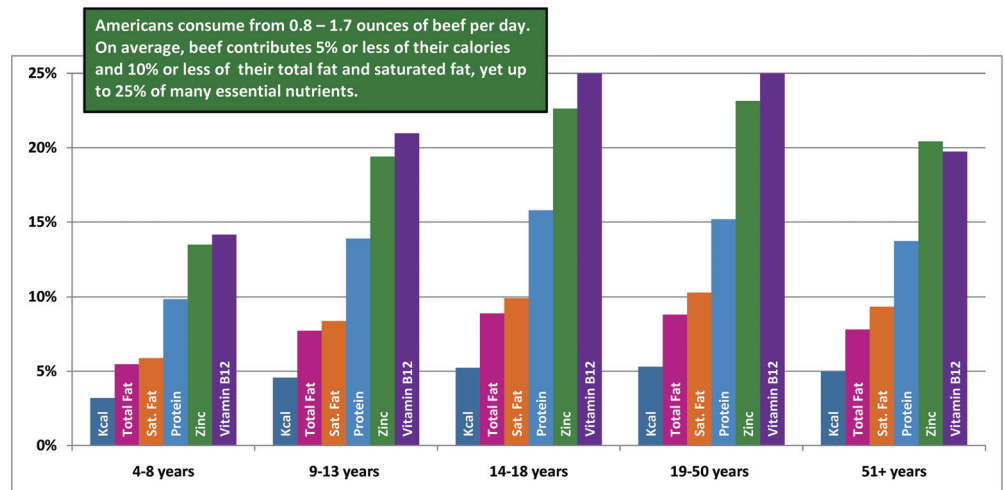
NHANES releases public data files in two-year increments. To meet statistical criteria, data from 1999-2004 was used. Taped interviews conducted with adults, children and adolescents provided recordings of their 24-hour recalls as well as health examination components such as body fluid analysis, body measurements and

performance. Statistical analyses were performed to evaluate the contribution of total beef and lean beef consumption to total diet composition.

#### Research Results:

The results show a similar outcome between the children, adolescent and adult subgroups evaluated in the study as beef consumption did not exceed the USDA *MyPyramid* recommendations for the Meat and Beans Group. Consumption of beef provided significant contributions to the intake of protein and important micronutrients including vitamins B6 and B12, zinc, iron, niacin, phosphorus and potassium, for all age groups. This was accomplished with a contribution of only 5% to total calories and less than 9% to total fat (lean beef less than 4.5%) and 1% to sodium.

Furthermore, these studies also document that the contribution of beef to the saturated fat intake is 10% or less in all age groups. The findings that 90% of the saturated fat in American diets come from food sources other than beef is noteworthy.



Nutrient-rich foods such as beef play an important role in meeting current nutrient guidelines for healthy Americans. The chart above shows beef's contribution to the intake of several important nutrients for all age groups, while only moderately affecting the intake of calories, total fat and saturated fat.

A 3-ounce serving of lean beef can be a part of a heart-healthy diet as suggested by the American Heart Association. Sixty percent of the total fatty acids in beef are either stearic acid (a neutral saturated fat) or monounsaturated fatty acids (MUFA). Unlike other long-chain fatty acids, stearic acid has been shown to have a neutral effect on serum lipid levels. Consumption of beef and lean beef contributed significantly to the intake of protein, MUFAs and other key nutrients in the American diet.

Iron deficiency is the most common form of nutritional deficiency in the United States. It is important for the physical growth and cognitive development of children and in preventing iron deficiency anemia, a particular problem in young children, adolescent girls and women of childbearing age. Reducing iron deficiency is one objective of Healthy People 2020 that was retained from Healthy People 2010.

It is also important to note that at least 60% of the iron provided by beef is heme iron, which is the more absorbable form of iron. Recommendations to reduce the prevalence of low iron intake include consumption of lean meat, such as lean beef.

**Conclusions:**

These two studies suggest that consumption of lean beef is positively associated with a total dietary intake of important nutrients and should be encouraged by health professionals as part of an overall dietary pattern low in saturated fatty acids and cholesterol for all age groups. The NHANES data show that even the modest amounts of beef consumed contributed significantly to protein and seven very important micronutrients while not contributing significantly to overall intake of total energy, total fat, or saturated fat. Furthermore, it was shown that most of the saturated fat consumed was from sources other than beef. Intakes of beef were well within *MyPyramid* recommendations for all age groups.

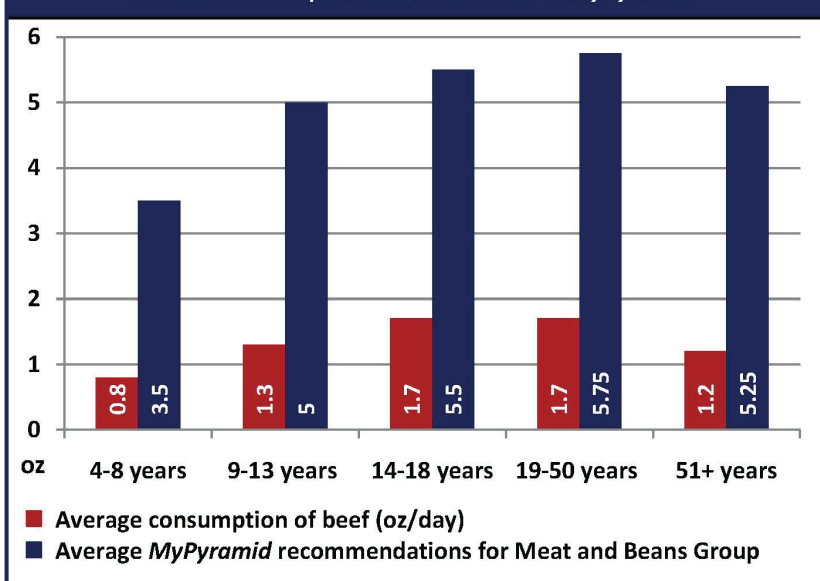
The authors also noted it is important when designing nutrition policy and making recommendations to the public to be as specific as possible, to consider the importance of recommending lean beef, and to include a variety of meats to maximize dietary adequacy.

This real-time study provides science-based evidence for the inclusion of beef and lean beef as part of an overall healthful diet for Americans of all ages.

**Key Findings:**

- 1. Amount of beef consumed by U.S. children, adolescents and adults was well within the USDA *MyPyramid* recommendations for the Meat and Beans Group.**
- 2. Consumption of total beef and lean beef contributed significantly to the intake of protein and seven important key nutrients in the diet while beef contributed only 5% to total calories and less than 9% to total fat (lean beef less than 4.5%) and 1% to sodium.**
- 3. Contribution of beef to the saturated fat intake is 10% or less in all age groups. The findings that 90% of the saturated fat in American diets come from food sources other than beef is noteworthy.**

**Comparison of average daily consumption of beef to the average Meat and Beans Group recommendations of *MyPyramid***



**Manuscripts:**

O’Neil CE, et al. Nutrient contribution of total and lean beef in diets of U.S. children and adolescents: National Health and Nutrition Examination Survey 1999-2004. *Meat Science* 87 (2011) 250–256.

Zanovec M, et al. Lean Beef Contributes Significant Amounts of Key Nutrients to the Diets of U.S. Adults: NHANES 1999-2004. *Nutr Res* 30 (2010) 375-381.



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