COOKING YIELDS AND NUTRIENT RETENTION FACTORS OF BACON, LIVER, AND SAUSAGES

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ABSTRACT

Objective: In the past, the USDA Nutrient Data Laboratory released a special table of nutrient retention factors. Recently, the nutrient database processing software (AIM, NDBS) was updated to include an improved nutrient retention module as well as a cooking yields module. Yield and retention studies have recently been conducted on bacon, liver and sausages. The objective of the studies reported here was to analyze and determine nutrient values, cooking yields and nutrient retention factors for bacon, liver, beef, chicken liver and sausages. Methods and Materials: The products analyzed were obtained from 12 nationwide retail outlets through the National Food and Nutrient Analysis Program (NFPN). All food items were analyzed raw and cooked. Bacon was baked, microwaved, and pan-fried. The livers were raw, baked, and braised. The fresh sausages were raw. Smoking, broiling, and oven-baking were conducted at a commercial laboratory. Nutrient data and weights were processed through the yields and retentions module of AIM, NDBS. Results: Yields varied according to trimming and cooking method. For example, baked and pan-fried bacon averaged a 31% cooking yield and microwaved bacon averaged a 26% cooking yield. While a few retentions were updates of existing ones, most retention factors were completely new and will be reported. Significance: The advent of the new yields and retentions module to the AIM_NDBS system streamlined the process of calculating cooking yields and nutrient retention factors from nutrient data. The recent studies performed on bacon, liver and sausages afforded an opportunity to update nutrient data, cooking yields and nutrient retention factors within a relatively short period of time. Yield and retention data will be used in food service operations, the food industry, universities and government agencies. These new cooking yields and nutrient retention factors will enlarge the nutrient database scope of food items from which users will be able to estimate data for cooked foods.

INTRODUCTION

The Nutrient Data Laboratory’s (NDL) Nutrient Database processing software (AIM, NDBS) has been updated and includes both an updated nutrient retention module and a cooking yields module. Recognizing a future need for updated and additional nutrient retention factors and cooking yields, NDL has conducted several studies on retail foods. Some analyzed in the current study include: bacon, beef, chicken livers and various sausages. This study provides an update to existing nutrient data and adds new, fresh products to the database. Additional new information: updates of existing retention factors and cooking yields.

OBJECTIVES

To analyze and determine the nutrient values, nutrient retention factors and cooking yields of bacon, liver, and various sausages.

METHODS AND ANALYSES

Sampling: 4 Naturally representative food samples were obtained and analyzed in duplicate from retail stores throughout the National Food and Nutrient Analysis Program (NFPN). Samples from the 12 retail stores were obtained in Maryland and Wisconsin.

Processing: Bacon

Baked for 11 minutes at 204°C and cooled for 1 hour. Bacon was pan-fried, baked, and microwave. Bacon was cooked to an internal temperature of 78°C (7-11 minutes) and cooled for 1 hour.

Turkey liver

Cooked to an internal temperature of 78°C (7-11 minutes) and cooled for 1 hour. Turkey liver was braised.

Chicken liver

Pork liver

Cooked to an internal temperature of 78°C (7-11 minutes) and cooled for 1 hour. Pork liver was braised.

Beef liver

Cooked to an internal temperature of 78°C (7-11 minutes) and cooled for 1 hour. Beef liver was braised.

Pork sausage

Calves sausage

Beef, sausage

Cooked to an internal temperature of 78°C (7-11 minutes) and cooled for 1 hour. Pork and turkey, sausage, liver, braised. All sausages were precooked.

Calculation and Formulas

Moisture Gain/Loss

Retention

\[ \text{Retention} = \frac{\text{wt (g) raw sample} - \text{wt (g) cooked sample}}{\text{wt (g) raw sample}} \times 100 \]

Nutrient Content of Sausages (g/100 g of food)

SUMMARY

Bacon had the lowest yield.

Thiamin retention for baked bacon was lower than for pan-fried and microwaved bacon in spite of similarities in cooking yields.

Beef liver and fresh sausages had greater retention of iron and phosphorus.

Turkey sausage had a cooking yield of over 100% due to a fat gain.

Cooking yields were consistently higher for precooked sausage products when compared to the respective fresh cooked products.