

# Evaluating the Nutritional profile of Goat Patties formulated with Flaxseed Meal

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## ABSTRACT

In an effort to provide a healthier meat alternative to the U.S. Consumers, goat meat, a rich source of protein, and flaxseed, a rich of essential and omega-3 fatty acids, were formulated to create a value-add meat patty; a traditional meat product. The objective of this study was to evaluate the nutritional quality of goat patties formulated with flaxseed. Goat patties were formulated with flaxseed at 0, 3 and 5% and grilled to an internal temperature of 80°C. Cooked patties were assessed for moisture, protein, fat, carbohydrate, calcium, sodium, dietary fiber, saturated, monounsaturated and polyunsaturated fatty acids using AOAC (16th edition) procedures. Total fat was significantly lower in goat/flaxseed patties at 3% (4.70g/100g) and 5% (5.23g/100g) when compared to the control (7.64g/100g). Saturated fat was lower ( $P < 0.05$ ) in goat/flaxseed at 3% (2.15g/100g) and 5% (2.28g/100g) than in control (3.63g/100g). Polyunsaturated fatty acids at 3 and 5% flaxseed/goat were 0.62 g/100g, and 0.89g/100g respectively, and were significantly higher than control (0.50g/100g). Calcium ranged from 25 to 28mg/100g were higher ( $P < 0.05$ ) than control (11.0mg/100g). Sodium content in goat/flaxseed (72 – 67mg/100g) patties was reduced ( $P < 0.05$ ) at control levels (78.0mg/100g). Dietary fiber was increased ( $P < 0.05$ ) only at the 5% flaxseed (6.1g/100g) level. Moisture content was slightly higher than control (65.0%) at 3% (66.49%) and 5% (68.21%) flaxseed. Protein and monounsaturated fatty acid content were not influenced by flaxseed addition. The data indicated that the addition of flaxseed resulted in a product with reduced total fat and increased polyunsaturated fatty acid. These findings will be useful in providing a healthy meat product alternative for health conscious consumers.

## INTRODUCTION

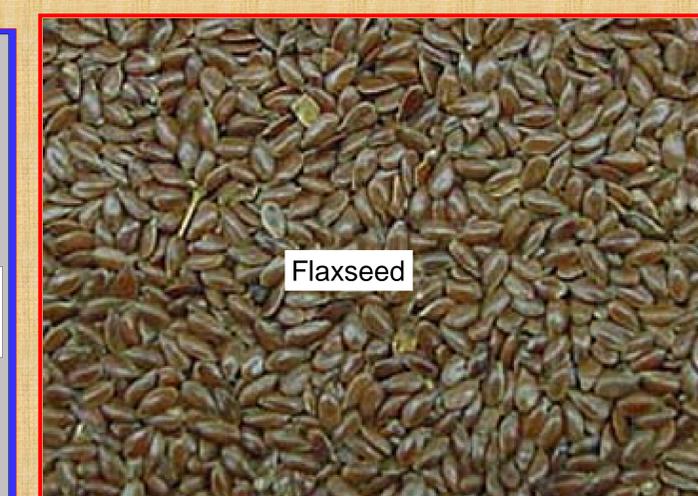
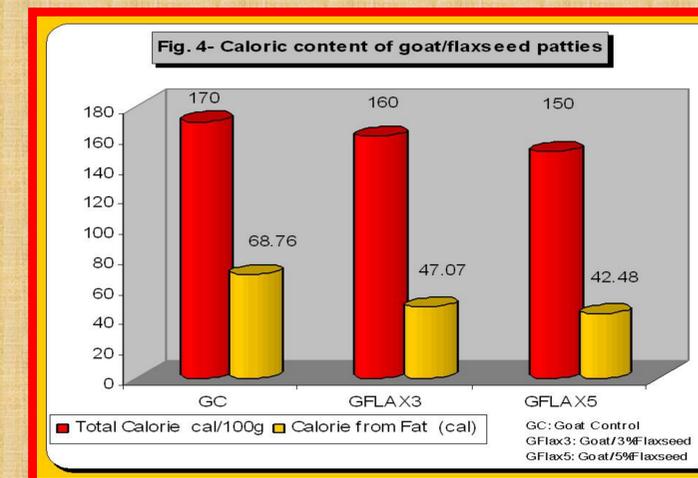
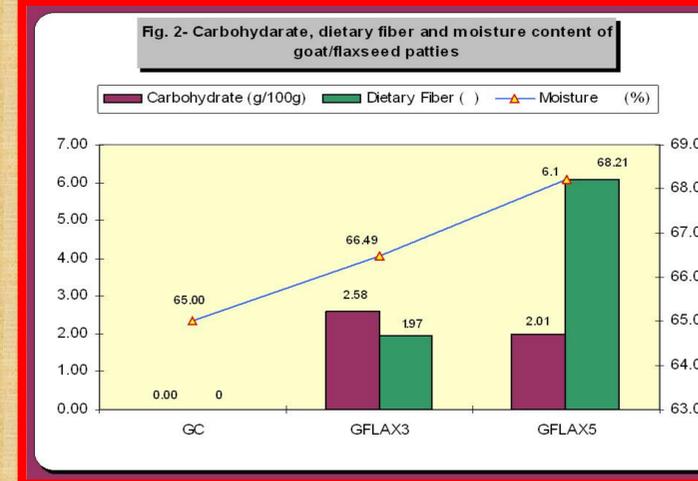
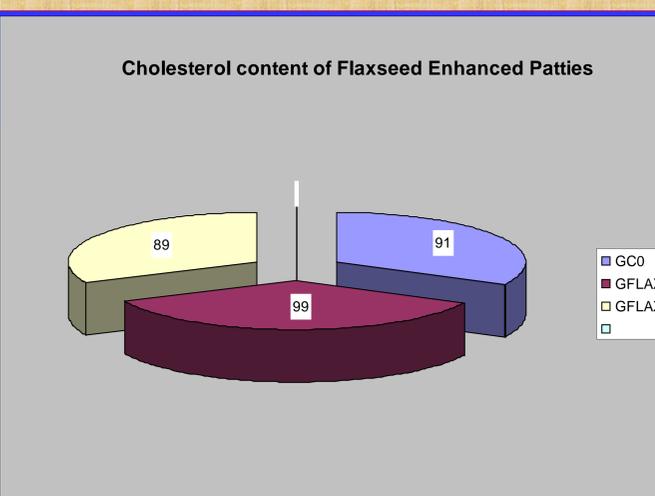
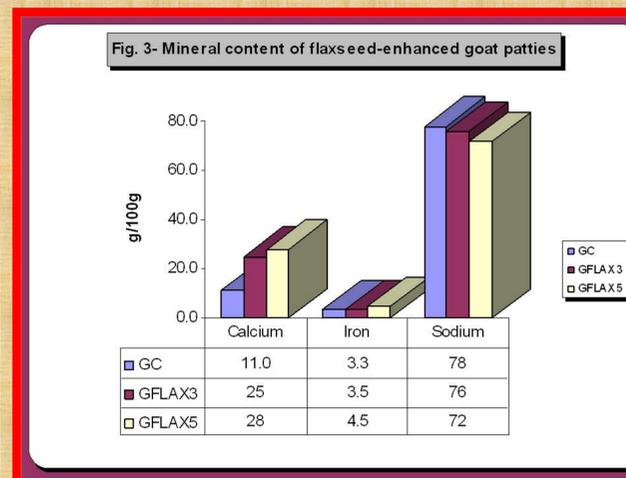
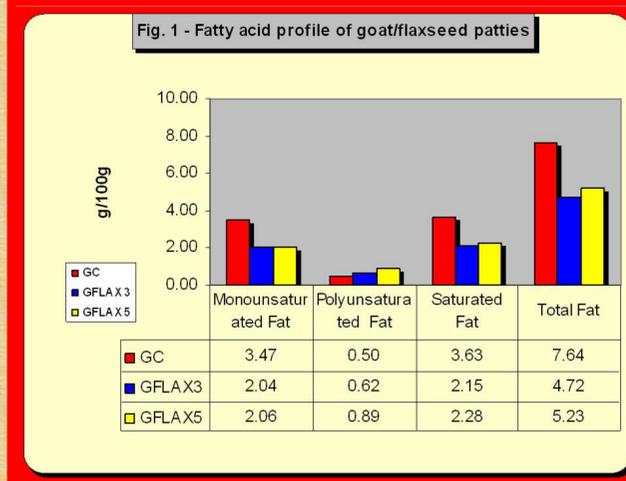
American consumers have become more health conscious. Concerns over health issues like obesity and the increased prevalence of certain diseases associated with saturated fats and sodium, have caused an increase demand for heart-healthier meats and meat products in the market place. Since dietary choices profoundly influence long-term health, the ability to choose healthier value-add meats products becomes essential. Goat meat, a rich source of protein is not widely consumed in the United States, because of negative perceptions associated with their suitability for consumption. Flaxseed is recognized as one of nature's richest source of essential and omega-3 fatty acids and has been proven to be effective against coronary heart disease. In an effort to enhance the economic viability of goat farmers, we created traditional meat products (patties) incorporated with flaxseed, which might create an outlet for their products.

## OBJECTIVE

The objective of this study is to evaluate the nutritional quality of goat patties formulated with flaxseed.

## PROCEDURE

Goat patties were formulated with flaxseed at 0, 3 and 5% and grilled to an internal temperature of 80°C. Cooked patties were assessed for moisture, protein, fat, carbohydrate, calcium, sodium, dietary fiber, saturated, monounsaturated and polyunsaturated fatty acids using AOAC (16th edition) procedures.



## RESULTS/DISCUSSION

(Figure 1) Total fat was significantly lower in goat/flaxseed patties at 3% (4.70g/100g) and 5% (5.23g/100g) when compared to the control (7.64g/100g). Saturated fat was significantly lower ( $P < 0.05$ ) in goat/flaxseed at 3% (2.15g/100g) and 5% (2.28g/100g) than in control (3.63g/100g). The reduction of saturated fat in Flaxseed enhanced Goat patties would have a positive impact on cardiovascular disorders. Polyunsaturated fatty acids at 3 and 5% flaxseed/goat were 0.62 g/100g, and 0.89g/100g respectively, and were significantly higher than control (0.50g/100g). The results suggest that polyunsaturated fats, including the omega-3 fatty acid (ALA) would significantly enhance the nutritional value of these patties.

(Figure 2) Dietary fiber was significantly increased ( $P < 0.05$ ) at the 5% flaxseed (6.1g/100g) level. The implication of these results have overall nutritional benefits. Several studies have indicated a marked association with increase dietary fiber and specific forms of cancer, especially colon cancer. Moisture content increased significantly ( $P < 0.05$ ) as the flaxseed content of the patties increased.

(Figure 3) When Calcium, Sodium and Iron were examined, both Sodium and Iron were equal to and or greater in content levels than the control patty. Sodium content in goat/flaxseed (72 – 76mg/100g) patties was reduced ( $P < 0.05$ ) at control levels (78.0mg/100g), and Iron content in goat/flaxseed (3.3 – 3.5mg/100g) shown no significant difference at the control level. However, Calcium for goat/flaxseed patties at 3%, and goat/flaxseed patties at 5% ranged from 25 to 28mg/100g respectively, and were significantly higher ( $P < 0.05$ ) than control (11.0mg/100g).

(Figure 4) A significant difference at  $P < 0.05$  was observed in energy (kcalories) distribution from fat. Fat calories were significantly lower in goat/flaxseed patties at 3% (42.76kcal/100g) and 5% (47.07kcal/100g) when compared to the goat control patty (68.76kcal/g).

## CONCLUSION

The data indicates that the addition of flaxseed resulted in a product with reduced total fat and increased polyunsaturated fatty acid, increased calcium and reduced sodium. All polyunsaturated fats, including the omega-3s, are increasingly recognized as important to human health.. These findings will be useful in increasing the utilization of value-added agricultural commodities and in providing healthy food products such as Flaxseed enhanced goat patties for health conscious consumers.