Enhancing quality and value of meat ingredients for further processing

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SPG Contributions	Project Status	Duration/Timeline of Project (Year to Year)	Co-funders	Total Project Cost
$75,127.50	Completed	April 2014 – December 2018	Saskatchewan Ministry of Agriculture – Agriculture Development Fund (ADF)	$142,627.50

Project Description

Use of mechanically separated meats (MSM) and finely textured meats (FTM) allows the industry to recover valuable edible protein from the surface of poultry and pork bones, as the resulting meat material contains 10-15% protein. However, there are several drawbacks to using MSM and FTM in further processing: its high susceptibility to oxidation limiting its storage stability and its fine texture makes it suitable only for finely minced sausages. The study found that MS and FT pork had reduced ability to form a strong gel on heating, which also limits its utilization and decreases its value. The techno-functional and chemical properties of these meats contribute greatly to final product quality and consumer acceptance, so maintaining or improving the quality of these meat ingredients is critical.

Emphasis in this project was how to: firstly, understand variability of the meat ingredients and secondly to slow or stop oxidation in these meats by utilizing the antioxidant activity of infrared heated lentil flour and thirdly, to better understand MS meat gelation properties. Lentils represent a major crop in Canada and proving its antioxidant capability (in addition to its utility as a protein, starch, and fibre source) in a range of meat systems will widen and strengthen its local and international markets, specifically to that of the meat processing sector.

Outcome

Antioxidant activity in lentil seed coat and seed coat extracts was similar to commercial antioxidants and protected against lipid oxidation in cooked mechanically separated chicken.

Micronized lentil flour (4-8%) reduced oxidation in chicken sausages and meatballs, product of acceptable quality.

Combination of lentil flour and seed coat extracts have potential to increase product shelf life and lentil flour was also useful as a binder.

Combination of micronized lentil flour (6%) and beet powder (0.3% and 0.5%) showed similar redness to sodium nitrite however, sensory responses to purge colour were negative with the inclusion of 0.5% beet powder.

Overall, knowledge gained on the biochemical properties of mechanically separated pork may lead to improved quality and increased value for lentil ingredients. In addition, further proof of the useful role of infrared heated lentil flour and of lentil seed coat extracts on delaying oxidation of cooked meats under both fresh and frozen storage was shown.

Research Objective

OBJECTIVE 1
To determine susceptibility of mechanically separated meats (MSM) and finely textured meats (FTM) to myoglobin and lipid oxidation as a function of current meat recovery systems.

OBJECTIVE 4
To evaluate physicochemical, processing and organoleptic properties of micronized lentil flour-treated MSM/FT meats processed into products with and without sodium nitrite.

OBJECTIVE 2
To determine oxidative stability (over a period of refrigerated storage) of fresh MSM or previously frozen MSM when treated with micronized lentil flour or with other natural or synthetic antioxidants.

OBJECTIVE 3
To evaluate the physicochemical and sensory characteristics of frozen processed products made with MSM/FT meats treated with antioxidants during simulated retail frozen storage.