

Thermal pretreatment of pulses for innovative ingredients and consumer-ready meat products II: Going global

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SPG Contributions	Project Status	Duration/Timeline of Project (Year to Year)	Co-funders	Total Project Cost
\$63,541.00	Completed	April 2013 – March 2018	Agriculture and Agri-Food Canada	\$352,075.00

Project Description

To develop innovative thermally treated (via infrared heat processing) lentil ingredients suitable for muscle food product applications and increase utilization of these pulse-based ingredients in consumer-ready muscle food products in global markets.

Outcome

The overall goal of this project was to develop innovative thermally treated lentil ingredients suitable for global muscle food product applications and increase utilization of these pulse-based ingredients in consumer-ready muscle food products in global markets. This was achieved through evaluation of infrared heat processing to improve functionalities of lentil flour as a multi-functional meat extender in frozen and heat processed comminuted muscle food applications, development of lentil flour-enhanced meat products for global markets, and consumer evaluation of these meat products.

To encourage a meat processor to switch to new ingredients, they must be multi-functional and offer both processor and consumer benefits. This study involved a detailed evaluation of micronized lentil flour, lentil seed coat, and lentil cotyledon in fresh and frozen beef burgers during storage. Additional evidence of the efficacy of specific lentil fractions in beef systems has shown good performance (enhanced color and lipid stability) in both raw and frozen beef model systems. A deeper understanding of the antioxidant activity of lentil components in meat products was gained by evaluation in model myoglobin systems. Heat treated lentil flour, seed coat and seed coat extracts were also evaluated using mechanically separated chicken as the meat model, showing antioxidant activity in cooked mechanically separated chicken meat and related meat products (meat balls, sausage). These studies showed the potential mechanism of action of lentil bioactive compounds in meat products and demonstrated the "clean label" potential for lentil components to replace the antioxidant and texturizing function of sodium tripolyphosphate in non-cured chicken sausage.

Expertise gained in infrared heated lentil flour was shared with ingredient and meat processing companies. InfraReady Products 1998 Ltd., the industry partner on this project, created a targeted marketing campaign for the infrared heated lentil flour, now called NutraReady™ (www.nutraready.org). Several commercial applications have resulted and further evaluations are underway. To promote expanded lentil utilization in international markets, we investigated the Filipino and Sri Lankan markets, and determined that Sri Lanka was a more promising market. A major meat processing company in Sri Lanka provided assistance in developing two Sri Lankan style processed meat products. A cross-cultural consumer study with Canadian and Sri Lankan consumers in both Canada and Sri Lanka allowed us to optimize addition level of heat-treated lentil flour in these products. There were some subtle differences in consumer responses between the Sri Lankan and Canadian populations, but in general, utilizing a diverse Canadian panel would provide sufficient consumer acceptance data to create prototypes to attract international buyers of Canadian lentil ingredients.

Research Objective

OBJECTIVE 1

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