Food Safety

The need for safe and nutritious food has been a concern since man first walked the earth, though regulations on food safety issues were not introduced until the 19th century. These regulations have continued to be modified to address new challenges in this area. In Canada, the Safe Foods for Canadian Act was introduced in 2012 to strengthen inspection activities related to food safety and assure that necessary steps are taken to make food as safe as possible. The importance of food safety at national and international levels cannot be understated. In the setting of priorities for Agricultural and Agri-Food Canada for 2013-14, managing risks, including those associated with food safety, was one of three strategic outcomes. The provincial government in a quote from MP James Brazen also stated that ‘Food Safety is a priority for our government’ and funding would be available to assist in ensuring safe food. According to Statistics Canada(2012) over $142 billion was spent on food and beverages in stores and restaurants in 2007, with more than 70% produced domestically. Assuring that this is all safe is a big job.

Addressing food safety issues has been a research strength at the University of Manitoba for many years. Program accomplishments include internationally recognized expertise in food safety that positions the University of Manitoba towards continued leadership on the national and international stage. In the last 5 years, for example, more than $2 million has come into the Department for work related to food safety. This funding includes NSERC grants (Discovery, Strategic, Create and Engage programs), as well as provincial funding through the ARDI program and funding from several industry partners. In recent years this work has been spearheaded by Dr. Rick Holley who has ~200 publications in this area. In addition to the research, he has received national recognition through serving on advisory panels for the Canadian Food Inspection Agency, for Health Canada, and on the International Union of Food Science and

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Technology (IUFoST) security/safety council. He is in demand by the media every time a food safety issue comes to light, and this happens frequently. Community and industry impact is evidenced through frequent invitations and large turnouts to events hosted by the U of Mb. For example, Dr. Holley recently received the Dr. R Campbell Outreach Award, with >400 media local, national and international interviews in past 5 yrs, and numerous consultation with industry and governments dealing with food safety crises.

Work on food safety, in particular concerns with respect to microbial safety, continue and have recently be strengthened by the addition of a new faculty member who has expertise enabling studies at the molecular level of microbial pathogenicity. A collection of over 500 organisms isolated from food, animals, clinical samples and the environment is maintained at -80°C to ensure work can continue in this area. The expertise of the two faculty members currently working on microbial food safety through strong collaborations with microbiologists in other departments, including Animal Science, Soil Science, Microbiology and Medical Microbiology, as well as outside the University, leaves us well positioned to continue to contribute to this important research area.

**Processing of Grains and Oilseeds**

The production of crops has been around for many years and is the main source of food for many people globally. From a Canadian perspective, and also a Manitoba perspective, the main crops are grains and oilseeds with wheat and canola representing approximately 35 and 25% of production. In Manitoba, there are also a number of other crops, including oats, flax, soybean and pulse crops that make significant contributions to crop production. For peas and lentils, for example, Canada is the largest producer in the world. For many years, Canada was known for its ability to grow and export these valuable commodities, but in the last 20 years, there has been increasing emphasis on adding value to these crops either before exporting or for domestic consumption. An increase in the level of value added processing can significantly impact the economy.

Utilization of grains and oilseeds has been an important area of research in the Department of Food Science with five faculty members (~ ½ of what we have) and a number of adjuncts working in this area. Collectively faculty members (not including adjuncts) have generated research income, including equipment grants, of about $4 million in the past 5 years. In addition, one faculty member has a Canada Research Chair which was renewed (total value $1 million). Funding has come from International funding agencies (e.g. CIDA), national agencies such as NSERC (discovery and strategic and research tools grants), provincial ARDI and WGRF funds, Grower Organizations, as well as individual industries. Output during the past 5 years includes ~ 150 publications (referred and non- referred) and ~150 presentations made locally, nationally and internationally. In addition, these faculty members have represented the University on a number of Boards/ organizations such as Manitoba Pulse Growers Association, Grains for Health, Food Development Centre Advisory Board, Institute for Grains and Health Research, The Whole Grains Council, Whole Pulse Expert Advisory Committee of Pulse Canada,
and served on committees for organizations such as NSERC, AERES (French evaluation agency for research and higher education), American Association of Cereal Chemists International (AACC), Institute of Food Technologists (IFT), Canadian Institute of Food Science & Technology (CIFST), American Chemical Society, Canadian Pulse Crop Workshop, and Association of Official Analytical Chemists International. This group has clearly made a strong contribution to the science associated with processing of grains and oilseeds.

The nature of the research is diverse and ranges from the basic mechanisms for network or dough formation to the role of bubbles in foods to effectively incorporating nutraceuticals into grain-based products. In addition to understanding the effects of processing on foods from cereals, products made using novel ingredients (e.g. pea fibre or bean flour or canola protein) have received attention as ways to improve the nutrition and functional properties or serve unique markets (e.g. gluten free). The work goes from the basics to the applied and not only advances science but provides valuable information for industry, as the production and processing of grains is a major focus in Manitoba. Work done in Food Science in conjunction with other departments (e.g. Physics & Astronomy, Biosystems Engineering, Human Nutritional Sciences) and external agencies (Canadian Grain Commission, Canadian International Grains Institute, Agriculture and Agri-Food Canada) provides effective training for future researchers while providing valuable information for the maintenance and growth of grains and oilseed processing.