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Cover: Canada's national sport has turned to industrial research to improve the game. One Canadian company, using an industrial research assistance grant from NRC, has introduced new materials and production methods in the manufacture of hockey sticks. Canadian Hockey Industries, of Drummond-ville, P.Q., using plastics and fibreglass in place of all-wood sticks, has created a line more durable and flexible than the old sticks. Yvan Cournoyer of the Montreal Canadiens is shown here using one of the CHI's sticks in play. (Story p. 4) Painting by Don Anderson; photographed by Charlie King.

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The Gordon Royal Maybee Award for significant achievement by a Canadian company or institution in the food industry was presented to NRC's Prairie Regional Laboratory on June 25, 1978. Donated by the Canadian Institute of Food Science and Technology (CIFST), the award was accepted by PRL's Dr. Clare Youngs at the Institute's annual meeting in Edmonton, Alberta. To quote the presentation address, PRL received the award "for its outstanding research in the processing of rapeseed and field peas, and for the development of village-scale milling processes for the less developed countries." The address went on to say that the Canadian rapeseed and field pea processing industries were established largely as a result of PRL's pioneering research and the leadership it provided in encouraging a cooperative team approach among laboratories in government, industry, and the universities.

PRL's interest in rapeseed goes back to the Laboratory's inception in 1948, and a decision by the late Dr. Henry R. Sallans to study the crop as a potential source of edible oil for humans and meal for animal rations (until then, rapeseed's primary use had been as a lubricant for steam engines). Under Sallans, who later became director of PRL, methods were worked out for measuring very small amounts of certain undesirable constituents found in rapeseed oil. With these analytical tools, PRL became the centre of collaborative studies on the breeding of rapeseed, the processing of the seeds, and their nutritional aspects.

During the early phases, Dr. Sallans and Dr. Burton M. Craig, currently Director of PRL, carried out the first complete analysis of rapeseed oil. Later, Dr. Craig developed rapid and accurate analytical methods for fatty acids using very small samples in a gas chromatograph. These procedures were used in subsequent nutrition studies and in breeding programs to develop a rapeseed variety low in erucic acid, a fatty acid implicated in the formation of heart lesions.

Meanwhile, Drs. Leslie R. Wetter and Clare G. Youngs developed analytical methods for measuring minute

quantities of toxic compounds in rapeseed meal which were known to cause thyroid and growth disorders. The procedures were used to reveal the mechanism whereby non-toxic "parent" substances called glucosinolates were broken down enzymatically into toxic products when the seed was crushed. This led to a modification of the crushing process that resulted in destruction of the enzyme before the breakdown could take place. Oil and meal produced by this process demonstrated improved nutritional quality.

The success of this research is reflected in the growth of the oilseed industry on the Prairies. During the last three decades, seven crushing plants have been built in Western Canada and rapeseed, now the third largest crop in Canada, provides cash receipts to farmers averaging \$270,000,000 annually.

Recognizing that a high protein crop was required to supplement agricultural grain and oilseed production in Western Canada, PRL began a program in 1968 to evaluate the proteinrich field pea as a crop for the prairies. The Laboratory initiated a multidisciplinary program involving university and industrial personnel to assist in making this a commercially viable crop. Dr. Youngs developed a process for separating pea flour into protein and starch-rich fractions, and a pilot plant, constructed at PRL to determine optimum processing conditions, was the basis for the Pro-Star Mills Limited plant in Saskatoon which began production in 1977.

PRL extended its food processing research to assist less developed countries. Projects were carried out by Dr. Youngs and Dr. R. Reichert to develop a village-scale milling process under a contract from the International Development Research Centre. Emphasis was placed on the dehulling of sorghum, millet and cowpeas by abrasion. This provided a successful process which is now used by a number of African and Asian countries, particularly in the milling of sorghum. The process has been widely accepted in Botswana and Nigeria where the installation of more mills is planned. **Wayne Campbell**