

OUR INDUSTRY TODAY

Technology Transfer Abroad: Tailoring Transfer to Industries and Markets

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ABSTRACT

On a world scale, the dairy food research centers in the US are in their infancy. Recognizing that programming can be accelerated by observing the experiences of well-established research centers, a symposium that focused on the operation and especially the technology transfer mechanisms used at four overseas research centers was held and is now reported. New Zealand, Australia, Switzerland, and the Netherlands participated through their respective dairy research organizations. These four countries represent distinct modes of operation in both dairy production and manufacturing and were selected to serve as models for dairy research operation in different parts of the US.

Each center balances long-term and short-term research to optimize its overall performance in a constantly changing marketing environment for a long-standing industry. Support is broad-based and includes marketing orders, processors, and government.

(Key words: technology transfer, industries, markets)

Abbreviation key: CSIRO = Commonwealth Scientific and Industrial Research Organization, EC = Economic Community, NIZO = Netherlands Institute for Dairy Research, NZDRI = New Zealand Dairy Research Institute.

INTRODUCTION

Producer-funded dairy foods research has evolved during its first 6 yr to include several programs, notably Dairy Centers, in which a

concentrated, focused research effort is supported by a partnership between industry and academia. Initial efforts with single project orientation have grown into coordinated research programs with clear, market-related objectives. Today, these objectives are yielding results, and the challenge lies in effective transfer of the newly generated research information to the commercial sector. Recognizing that the evolution of this unprecedented effort requires a shift in attention, the Wisconsin Milk Marketing Board sponsored a symposium at the 1989 Annual Meeting of ADSA at which representatives of the six Dairy Foods Research Centers described their respective attempts to transfer technology. The symposium was well attended and yielded an animated discussion period, which no doubt stimulated ideas for creative methods of bringing industry and universities closer together for the benefit of all.

It also became clear that the US was a latecomer to university-industry alliances on the scale evident overseas. Europe, New Zealand, and Australia have long histories of close and productive associations between the university and commercial sectors.

Thus, a second symposium sponsored by Borden, Inc. and the Wisconsin Milk Marketing Board was prepared for the 1990 Annual Meeting of ADSA. Representatives of New Zealand, Australia, Switzerland, and the Netherlands shared with the audience their respective experiences in commercializing technology—both the pitfalls and successes. These four countries were chosen because each has a unique structure providing four distinct models to study. This paper is a summary of the presentations made at the 1990 symposium.

DISCUSSION

Netherlands' Institute for Dairy Research

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(NIZO) described the origins of cooperation between industry and the research and development community in the Netherlands and today's working relationship (1). The Netherlands situation includes a milk production base of more than 11 billion kg of milk (1984), which is among the world's highest volumes of milk produced per unit of surface area. Twenty-seven processing companies, with a combined total of 100 factories, handle the milk. Of these 27 processors, three cooperatives handle approximately 70% of the total milk volume. These three cooperatives plus international companies located in the Netherlands each maintain a research laboratory of some size. This intensive production base and the relatively advanced position of the Dutch dairy industry with regard to processing and export has led to an acceptable farmer income. However, since the introduction of the European Community (EC) quota system in 1984, processing capacity has been in excess by approximately 20%. All of these factors have forced dairy research to adjust significantly to the challenges brought forth by economic realities. Following World War II, the Dutch were determined to improve the position of their dairy industry in the world.

This objective demanded expanded research and development efforts—efforts greater than those any one processor could sustain on its own. Thus, in 1940, the industry as a whole, through the legislatively mandated Dairy Commodity Board, created NIZO. Through the years, this national dairy research center gained facilities and staff with funds derived from the Dairy Board (via a levy), from contract research with the Dutch government or the EC, and from contract research with private enterprises, sale of special products, license returns, and miscellaneous income. Income in 1989 was 26.7 million Dutch guilders or approximately \$15.3 million (US).

One can appreciate the closeness between NIZO and the Netherlands dairy industry. Various activities, such as an advisory board, seminars, and meetings, contribute to the infrastructure. Depending on the nature of the funding, the research data are either presented at seminars; published in newsletters, trade journals, and in scientific journals; or transferred directly to the contract partner. As the industry becomes more competitive, NIZO has gravitated toward more fundamental research.

Applied research is initiated only at the request of the processor. Given that more multinational research efforts are on the horizon, the NIZO research and development program will be challenged to meet the needs of the Dutch industry as well as the needs of its EC partners.

Swiss Expertise

Transfer of research information and technology in Switzerland is uniquely adapted to the nation's diffuse cheese production industry, as Zdenko Puhon, Head of Laboratory of Dairy Science, Zurich, remarked during the 1990 symposium (3). Switzerland's alpine and valley terrain contrasts with the Netherlands, as does its large processor to producer ratio. Approximately 85% of the more than 4 billion kg of milk produced is handled by cooperatives and primarily manufactured into cheese. Cheese making remains a craft accomplished by approximately 1400 village cheese factories processing from 1000 to 10,000 L/d. The philosophy is that "milk shall be processed where it is being produced." Thus, transfer of technology from research institutions to numerous small volume processors offers a unique challenge that requires a multidimensional approach.

In order for any technology to be absorbed, an educated staff is needed at the plant. Given the situation described. In addition to university course degrees, Switzerland established a strong vocational education system governed by private law for both production and processing. Several skill levels can be attained, up to master cheese maker. There are very few unskilled laborers in the cheese plants. Dairy research in Switzerland is preformed at either the Institute of Food Science of the Swiss Federal Institute of Technology in Zurich or at the Swiss Federal Dairy Research Institute in Liebefeld-Bern. The latter is considerably larger, with a staff of 130, including 35 to 40 scientists, and concentrates its efforts on problem-solving research for the industry. In addition, it offers advisory and supervisory functions covering all aspects of cheese manufacturing, from raw milk to the final products, including the selection and supply of starter cultures for daily production.

By and large, the 1400 cheese factories make raw milk cheese varieties. Often the

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