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John Wenzel holds a Canadian egg. His work with chickens and marigolds in Bolivia has greatly improved the quality of eggs there.

Turning egg yolks into gold

Kingston man's expertise a godsend to Bolivian farmers

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In Bolivia, the priciest chickens dine on marigolds. Which is why John Wenzel of Macdonnell Street in Kingston is something of a blessing to hundreds of Bolivian poultry farmers.

In that tiny South American country west of Brazil, as in many other developing nations, farmers have learned that mixing bright yellow marigolds into chicken feed can help overcome the unappetizing — and financially disastrous — "white yolk" problem.

"In Spanish-speaking countries they like their chicken flesh to have a yellowish tinge and they like their yolks to be yellow," Wenzel says.

Wenzel, 70, came to Kingston after retiring 5½ years ago as vice-president of research and development at Griffith Laboratories, Canada's largest food-ingredient processing company.

Forty-two years of experience on the technical side of the food-processing industry and a passionate interest in Third World development made him a perfect candidate for an unusual technological mission late last year. The mission, to help improve Bolivia's highly inefficient marigold processing business, was organized by the Canadian Executive Service Organization (CESO), an international volunteer consulting service. Wenzel, who has a master's degree in biochemistry and has been a CESO consultant for the past seven years, was dispatched to Bolivia's second largest city, Cochabamba.

Although North Americans have come to expect a spot of color in their eggs, he says, the yolks found in underdeveloped countries are often white because they lack common pigments known as carotenoids.

These pigments are responsible for the orange color of carrots and are found in many feed plants such as grass, alfalfa and yellow corn. But in countries such as Bolivia, where animal feed is often produced from primitive seed strains, and where the feed corn is typically white, carotenoids have to be added in.

Since marigolds are rich in carotenoids and can be consumed safely in small quantities by chickens, they have become the main defence against Bolivia's white yolk problem, he says.

They are also easier and cheaper to grow in some South American climates than alfalfa or grass, he added.

"It's about the only way they have," Wenzel says. "They don't grow alfalfa and they don't have enough yellow corn."

Working with the Cochabamba Centre for Social Development, a non-profit farming-improvement organization with about 500 member families, Wenzel studied how to reduce the cost of turning fresh local marigolds into dry feed. Although he says he has little knowledge of flowers, he did, at various times, run cereal and spice drying operations for Griffith Laboratories.

The existing process in Cochabamba, he says, was to chop up the flowers with a grinding machine, spread them on a 250-ft.-square concrete drying pad to be dried by the sun and then grind the dried flowers for sale to chicken farmers. But Wenzel says the farmers employed highly inefficient methods such as using their feet to turn over the flowers on the drying pad.

The primitive state of their processing system, he says, was vastly improved with relatively simple modifications. But he says that developing countries such as Bolivia are testaments to the maxim that a little technology can go a long way.

Wenzel recommended, for example, that the farmers simply use a rake-like device to flip the flowers, rather than using their feet. He also recommended covering the drying pads with large transparent plastic sheets about six feet above ground to keep the rain off and to store heat, as in a greenhouse.

The Bolivians originally planned to use a more sophisticated process known as solvent extraction, he says. In this

Please see YOLKS, Page 21

March 19/88 - Winn Standard Page 21

Yolks

Continued from Page 19

process the carotenoids are chemically removed from the marigolds with hexane, a colorless component of gasoline commonly used in oil-seed extraction.

But Wenzel, who once operated a hexane extraction plant for Griffith Laboratories, recommended against it. He says that in addition to requiring an $800,000-processing plant, solvent extraction can be dangerous if not closely supervised.

Besides, he says, the Bolivians "didn't have enough volume and they didn't have enough expertise." He estimated that chicken feed only requires about one-to-two per cent marigold powder to turn yolks yellow.

By contrast, the capital cost of his solar drying modifications would be about $25,000, he says. "You've heard of appropriate technology? This is appropriate technology."

Wenzel also searched the available scientific literature on marigold growth with the help of the National Research Council of Canada's computer database and discovered that by rotating marigolds with potatoes in alternate years you could increase the flower yield sharply because important nutrients are left behind in the soil by the potatoes.

Although much of the population cannot afford to eat chicken on a regular basis, Wenzell says, yellow yolks and richly colored meat are in demand among the more affluent, which will help increase farmers' revenues.

Wenzel, a former chairman of the Canadian Hunger Foundation, also believes Bolivia's genuine economic development is the only answer to a heavily drug-dependent economy. "If this drug problem is going to be solved, you've got to reduce the demand for the product," he says. "Because these people have nothing."

Wenzel's own consulting advice was provided free, he added, and the $4,000 airfare costs for he and his wife Annabel were borne by the Canadian International Development Agency. The Cochabamba Centre for Social Development paid for their accommodations while in Bolivia.

The Cochabamba centre's next project, he says, will be to try and market the marigold feed to the United States.