

APPLE-PIE LEFTOVERS

A pioneering researcher at NSAC is turning apple-processing waste into value-added foods and nutraceuticals

Thousand of years ago, Asia's wild apple was a small sour fruit. After centuries of cultivation, the apple is now the most popular fruit in the world. Its popularity may have something to do with its health benefits. Apples are loaded with fibre, vitamins, and minerals, and their unique antioxidants have been linked to a lower risk of many different cancers, cardiovascular disease, type 2 diabetes, and asthma. Eating apples may even improve lung function and slow or prevent neurodegenerative diseases such as Parkinson's and Alzheimer's.

Now Dr. Vasantha Rupasinghe, an assistant professor and Tree Fruit Bio-product Research Chair at the Nova Scotia Agricultural College (NSAC) in Truro, N.S., is focusing on making the apple even healthier. "We're looking at ways to use apples to deliver healthy supplements to peoples' diets," he says. "Most of our research is geared to finding things we can introduce to consumers." At the University of Guelph, where Dr. Rupasinghe earned his doctorate, he and his research team received the 2005 Ontario Agri-Food Innovation Award for introducing fresh-cut apple slices to Canadians at McDonald's restaurants.

About 2,800 hectares of Nova Scotia orchards produce 8.5% of Canada's apples every year; most of the orchards are located in the Annapolis Valley. To help make farms more productive and profitable, the Nova Scotia Fruit Growers' Association has collaborated with government to set up the research chair. With state-of-the-art analytical equipment in the new natural-product chemistry lab at NSAC, Dr. Rupasinghe can investigate the apple's unique antioxidants. "We know that the apple is healthy," he says. "The big question we're trying to answer is why. The fruit does not have the highest total antioxidant content, but it is rich in many unique antioxidant compounds." NSAC is conducting the research in collaboration with other institutions, including Fukuoka University in Japan.

The program also is identifying new apple genotypes high in antioxidants and facilitating the development of superior apples through breeding and biotechnology. Collaborating with Drs. George Robertson and Ramani Soundararajan at Dalhousie University in Halifax, Dr. Rupasinghe and his team have discovered a flavonoid com-



Dr. Vasantha Rupasinghe: developing healthy snacks

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als that have specific health or medical applications. He is working with the apple breeders of Agriculture and Agri-Food Canada to identify or develop apples that are ideal for value-added food processing and to find new ways to prevent them from browning quickly. Most fresh-cut apples have a 12- to 14-day shelf life, something the industry would like to extend to three weeks or more. "No one wants to have preservatives in fresh fruit," says Dr. Rupasinghe. "But if you put in something natural, like cinnamon, for example, people usually don't have a problem with that."

Dr. Rupasinghe says his research plan on value-added apple juice could make Nova Scotian apple-juice producers more competitive with producers such as China, which has tripled its apple production in the last decade and is becoming a world leader in low-cost juice production. Citing industrial secrecy, he won't discuss his research plan, which he expects to launch soon. "I have some good ideas," he says, "but it's a little too early to talk about them."

Twenty years ago malnutrition was the biggest health problem in the world. "Today we have the opposite problem," says Dr. Rupasinghe. "People are eating too much—too much of things they shouldn't be eating, like trans fats. One way to fight that problem is to make foods like apples more appealing to consumers." In North America the snack-food market is close to three times larger than the health-food market. Says Dr. Rupasinghe: "One of my most passionate projects is to develop an apple-based healthy snack for North Americans." — TOM MASON

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pound abundant and unique in apple skin that could potentially protect brain cells from injury.

Given that 30% to 60% of an apple's antioxidants are in the skin, Dr. Rupasinghe's industrial partners, including Apple Valley Foods Inc., Grand Pré Wines, J.W. Mason and Sons Ltd., and Noggins Corner Farm Ltd., are particularly interested in finding new ways to use the peels. Nova Scotia uses more than half of the apples it grows in the processing industry, mainly in juice and frozen pies, and more than one million kilograms of peelings go to landfills or composting facilities every year.

Dr. Rupasinghe's task is to find ways to turn that waste into value-added foods and nutraceuti-

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