

THE JOY OF SOY

By Cliona Reeves

Are North Americans finally warming up to the health benefits of soy-based food products?

Media coverage of food and health-related issues is at an all time high. “Consumers are more health-conscious than ever,” says Kathryn Cooper, vice-president, market development & client services at the Guelph Food Technology Centre (GFTC). “Unfortunately, as a society, we’re also heavier than ever. Obesity has become a serious problem, particularly among children, many of whom are developing type 2, adult-onset diabetes before they even hit puberty. More and more adults are developing insulin sensitivity, a precursor to diabetes. If we don’t take action now, we’ll soon be in very serious trouble.”

In the battle of the bulge, many consumers have turned to the various low-carbohydrate diets, such as the Atkins, Zone and South Beach diets. “The problem with focusing entirely on drastically reducing or eliminating carbs is that it just isn’t healthy,” says Cooper. “It’s true that large quantities of simple carbohydrates, or sugars, would not be your best

choice. However, complex carbs, such as soluble and insoluble dietary fibre, are essential in the reduction of the risk of certain cancers, particularly colon cancer and to the reduction of blood cholesterol, a factor which can lead to heart disease. In addition, if you were to cut out carbs entirely, you’d eliminate glucose, the fuel your brain relies on for healthy functioning.”

So what’s a dedicated low-carb dieter to do? The answer could be as simple as soy.

“Soy has a wide range of applications in food products,” says Cooper, “and numerous soy-based products hit the market every year. It’s not just tofu anymore, but desserts, flavoured and blended beverages, cereals, meat analogues and snacks. In addition, by choosing a soy product, such as a veggie burger, over the higher-fat meat option, you are not only taking in soy’s high protein, good carbs and higher fibre and enjoying their health benefits, but you’re also removing



the higher-fat product from that meal.”

The health benefits are impressive. Dr. David Jenkins, professor in the department of Nutritional Sciences in the faculty of medicine at the University of Toronto and St. Michael’s Hospital, is internationally recognized for his research in the area of diet and heart disease. “In our culture, we tend to rely on medicines to combat illness,” says Jenkins, “but we wanted to find out how effective a cholesterol-lowering diet would be by comparison. So we studied three groups: the control group on a low-cholesterol, low-saturated-fat diet, the second group on a low-cholesterol, low-saturated-fat diet plus a cholesterol-lowering statin drug, and the third group on our Portfolio diet of viscous fibre, vegetable protein emphasizing soy, plant sterols and almonds. We called it the Portfolio after the financial model of maximizing gains and minimizing risk through diversification. What we found was that the Portfolio diet on its own

was as effective as the low-cholesterol, low-saturated-fat diet plus a first-generation statin drug, in this case 20 mg of lovastatin.”

Whether people will stay with a diet is, of course, the \$64,000 question. “It’s true that some people comply with a diet more rigorously than others, and we found that those who did stick with it had the best results,” says Jenkins. “Many warmed to the diet after a time, and if we can get more people eating along the lines of the Portfolio diet, the better the position we’ll be in to prevent heart disease in the general population, using drugs only in those cases where diet alone is not sufficient.”

Making products appealing to the palates of North American consumers is essential. To someone raised on a traditional Asian diet, a block of tofu floating in water is normal, and can evoke the cosy feeling of home cooking and comfort food. To North Americans, tofu is a bit alien, and

not everyone knows how to cook it in a way that will make mouths water. Manufacturers are rising to the challenge in various ways, from educating the consumer about how to cook tofu using recipes on the food manufacturers' websites, to preparing soy-based equivalents of favourite products, to sneaking soy in where you might not expect it. "While there will always be a market for products geared for people who are interested in exploring ethnic cuisines and learning how to prepare them, the time-strapped nature of the average North American's day does not tend in that direction," says Cooper. "Cooking from scratch is becoming a hobby, and convenience-oriented food products have an edge over ones which require more time and effort."

"Making a successful soy product requires striking a difficult balance," says Joanne Hollander, founder and president, Soyummi Foods in Montreal. "You want the product to be familiar enough that the customer will try it at least once. But you don't want to go too far and promise that a soy beverage will taste exactly like dairy milk, or that a veggie burger will taste exactly like a beef burger. That sets up inaccurate expectations and invites disappointment. But if the product is familiar enough to attract the customer once, and if it's good enough in its own right, it has a much better chance of succeeding in the marketplace."

Canada is particularly well placed to provide the different varieties of soybeans that the food industry needs to produce appetizing soy products. "Ontario produces about 73 per cent of Canada's soybeans, with Quebec, Manitoba and the Maritimes making up the remainder," says Dr. Linda Malcolmson, director, Special Crops, Oilseeds and Pulses with the Canadian International Grains Institute (CIGI). "Canadian soybeans are also exported worldwide. Interestingly, only about nine per cent of the world production of soybeans is processed directly into food, though in Asia the percentage is closer to 95 per cent. The rest goes to the crushing industry for oil and animal feed. This suggests a huge opportunity for Canadian farmers since Canadian soybeans tend to yield a larger seed, they're higher in the right sorts of proteins for food use, and many have the bland, non-beany flavour needed for effective food applications. Canada has a range of growing seasons – longer in Ontario, shorter in Manitoba, for instance – a reputation for a clean, pristine environment, and an effective system of identity preservation, to manage different varieties effectively and ensure consistent quality."

As with anything else, it's people who make the greatest difference. "Most importantly, the major players are talking to each other," says Malcolmson. "If processors need a soybean with a different amount of protein or a different flavour, the breeders, researchers, farmers and processors are

all working together to add value in an integrated way. Among the players are Agriculture and Agri-Food Canada's Soy 20/20 program, the Ontario Soybean Growers, the Manitoba Pulse Growers, the CIGI and GFTC."

Of course, one cannot simply toss a handful of soybeans into a product and expect instant success. Careful product development is also an essential part of the process. "From soy we can derive a wide range of ingredients, including soy protein concentrate, soy protein isolate, soy flour, soy grits, soy oil, and soy fibres, and some work better than others for certain applications," says Dr. John Michaelides, GFTC's technical director. "Cakes and muffins, for instance, did not

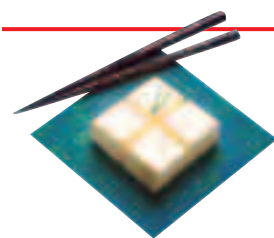
work too well with earlier varieties of soybeans, but with the breeding programs and feedback through the soy value chain in Canada, soy can work very well as a protein source for low-carb baked goods. Every case is unique, and requires a tailored solution, carefully balancing components to produce a pleasing whole."

"Soy was once considered a source of edible oil and protein for livestock. Suddenly it was recognized as a healthful food ingredient," says Dr. Wilmot Banda Wijeratne, director of research and food technology at Insta-Pro International. "Processors have to make sure that they are following the three rules for acceptable soy products: flavour, flavour and flavour. Building on soy breeding programs and cultivar selection, processing technology is an essential element in producing a successful soy product."

Ingredient houses are no strangers to tailoring flavours. "Despite the best efforts of

plant breeders and manufacturers, soy can still exhibit some off-flavours in certain applications," says Dr. Jonathan Gordon, technical development manager in the Global Sweet Goods Design Team at Firmenich Inc. He adds, "obtaining an acceptable product depends upon a thorough understanding of soy product formulation and processing." Masking techniques can be helpful in disguising off-notes. These include the addition of a flavour chemical that will compete for the same flavour receptors as the off-notes, masking the off-flavours by hiding them behind a wash of another neutral flavour or disguising the off-note with similar but desirable tonalities. Manufacturers can also use the off-note flavour chemical itself as a building block toward the desired tonality. In addition, future innovations in active packaging may assist by binding off-note chemicals."

"Soy foods are expected to be a \$5.2 billion market by 2006," says Elizabeth Sloan, president of Sloan Trends and Solutions Inc., a San Diego-based consulting firm providing trend tracking to the food industry. "Soy beverages are up 29 per cent generally, 28 per cent among low-carb dieters, and 17 per cent among mainstream consumers. Sales of soy-



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based bars are up 24 per cent and soy-based meat alternatives are up 14.5 per cent. New products are hitting the market every day, including snack foods, soy drinks, soy-juice blends, soy smoothies, cultured probiotic drinks, soy-juice fruit waters, nutrition bars, meat alternates – it just goes on and on.”

Part of this rise in sales is due to the unprecedented media coverage of health-related issues. As the older population uses nutrition to deal with actual physical symptoms or conditions and as young people continue to perceive a gap between what they eat and how well nourished they are, the more health will be a factor in food choices. “Quick-serve restaurants have seen an 11 per cent drop in sales of french fries and a 12 per cent rise in sales of salads,” says Sloan. “Whether eating out or at home, consumers are demanding healthy alternatives to the extent that, for the first time ever,

health is beginning to rival convenience as the number-one attribute they require of food products.”

And yet perceptions of soy are a bit of a puzzle. Most consumers, if they see soy on a food package, will regard the product inside as healthy, but if they’ve had a bad experience with soy in the past, they tend to associate soy with bad flavour. This unfortunately reinforces our cultural stereotype that what is good for you must not taste particularly nice and what tastes good must be sinful. “These views certainly add to the challenge of designing soy food products that will appeal to consumers,” says Sloan. “We have to remember that no matter how healthful a food product is, if it doesn’t taste good, consumers won’t buy it a second time.”

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IF YOU CAN'T BEAT 'EM, JOIN 'EM

Listening to the women at her local gym, Elena Quistini figured that the low-carb diet trend was going to have an impact on her business. As president of Woodbridge, Ont.-based Pasta Quistini Inc., her beloved food staple was under the gun. As she herself was on a low-carb diet, she decided to get in on the action.

Quistini says it took about six months to come up with a formula for soy pasta. “There were some imported low-carbohydrate pastas in the stores, but I couldn’t eat the second mouthful because it just wasn’t appetizing.” She discovered in her experiments with soy flour that the absence of gluten made it a poor candidate for pasta. “The mixture doesn’t stick, it breaks apart very quickly. So when I was trying to make pasta with 100 per cent soy flour it just didn’t work. When we started to add eggs and regular flour, we were finding that it was getting a little easier to work with.”

Quistini was aiming for a low-carb pasta, but found that when you put the maximum amount of soy in that would still extrude, the final result just wasn’t edible. “The whole idea is that if you’re not going to eat the second mouthful, then you haven’t really done anything to help anyone out,” says Quistini. “My idea is that it has to be reduced in carbohydrates, but you have to be able to eat it and enjoy it, and think ‘I hardly notice or didn’t notice any difference.’ I was going to go low-carb, but I wouldn’t eat it. I decided to go for a reduced carb label, so a 100 gram serving of my pasta is approximately 17 grams gross [of carbohydrates]. When you take off the fibres and sugars it’s about 14 grams of carbohydrates versus the 66 grams in the normal pasta you buy in the supermarket.”

Quistini’s soy pasta is called Carbs Count. There are three fresh pastas, a fusilli, rigatoni and a linguine available at upscale grocery and health food stores. The dry shelf-stable Carbs Count pasta will be available soon in Loblaws stores in fusilli and rigatoni formats.

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NOT THE SAME OLD SOY

Not all soys are created equal. Terry Gieseke, director of business development for Nutriant, A Kerry Company, explains that food processors will find significant differences from supplier to supplier across the soy industry based on the core raw material and the way the soy is processed.

At Nutriant, its soy is a variety grown specifically for the production of soy protein food ingredients. Gieseke says a majority of soy proteins that are used as food ingredients are first grown for their oil content. Because the oil is extracted with hexane it changes the nature of the soy protein as a result. "There is a distinct difference in both smell and taste between the raw protein powder from Nutriant and others," says Gieseke. "We're finding in some specific applications that it makes a huge difference in the way the product functions in applications for pasta, baked goods and snacks. The product extrudes differently, it doesn't interfere with gluten and some of the other taste properties of baked goods."

Across the board, though, Gieseke notes soy ingredients have improved dramatically in virtually every category you can name: taste, texture, function and performance attributes within different production processes. "But taste," she says, "is still on the top of the list for every soy ingredient manufacturer out there."

As the mainstream North American consumer develops a taste for soy the acceptance of the ingredient has grown. "Five years ago, soy equaled tofu, that was where consumers were. I think for a lot of people the introduction of soy milk into main-

stream grocery stores helped get them past that hurdle. Then consumers started to see soy in their energy bars and products like Boca burgers."

In general, Gieseke says that soy manufacturers are making technological advances in different areas. There is a fairly significant focus on grain-based foods and beverages. Soy protein has had issues with beverage applications. Notes Gieseke "it would either make it too astringent or it would settle out. Nutriant now has a solution for those problems. Our product makes the beverage very light, very clean and can match or exceed the nutrient profile of milk."

All of Nutriant soy beans are non genetically modified and they offer both organic concentrate and isolate. In addition to a broad range of product type from nuts to powder, Nutriant is committed to helping manufacturers understand the soy consumer as a distinct marketing group.

"The soy consumer group is a lot broader than it used to be," says Gieseke. "As you start to deliver great taste and healthy food choices, you get moms thinking in terms of 'It's got protein for my kids, reduced carbs for me, it tastes great, it's a part of all these convenience foods, maybe I'll have less concern about my husband's family history of heart disease.' The whole package starts to come together. The soy consumer has changed a lot, as there are so many points of appeal that soy can offer. Soy has spread its consumer reach."

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