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The official magazine of



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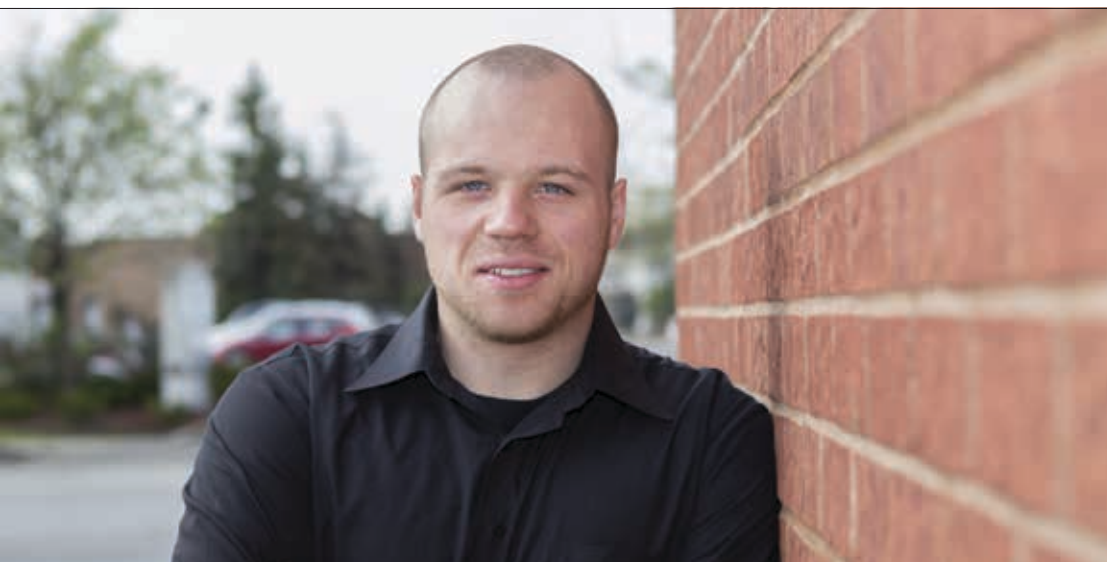
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NICOLAS HEFFERNAN

EDITOR FOR
CANADIAN FOOD INSIGHTS

An Opportunity for Canada

SINCE WE STARTED *CANADIAN FOOD INSIGHTS*, the official publication of the Canadian Institute of Food Science and Technology, I've tried to immerse myself in the Canadian agri-food industry as much as possible.

One of the things I heard most at the conferences I went to and in the news I read was that Canada needed a chance. We have so much potential, are world leaders in certain agricultural sectors and have one of the best – if not the best – reputation worldwide when it comes to the quality and safety of the food we grow and produce. Yet people in the industry weren't satisfied. We could do and needed to do better. We need an opportunity.

The announcement of the Comprehensive Economic and Trade Agreement (CETA) can and should be this opportunity. With preferential access to the largest economy in the world, Canadian agri-food has to take advantage of the elimination of approximately 98 per cent of all EU tariff lines.

Granted, the Canadian dairy farmers vehemently oppose a deal that they claim will give Europeans nearly 32 per cent of the country's fine cheese market. But rising Canadian demand is expected to be able to absorb the impact of European access. In any event Trade Minister Ed Fast said, "We've told the dairy farmers that if there is a decline in production as a result of additional access from the EU, which is only 4 per cent by the way, we are prepared to make them whole."

For the rest of the country this is a chance that can't be passed up. Perhaps the Barley Council of Canada Chair Brian Otto summed it up best for the industry saying, "CETA is the good opportunity that the Canadian barley value-chain has been waiting for. There is more work to be done, but we are confident that if our federal and provincial governments finalize this agreement, sustainable growth and profitability will be achieved."

An opportunity has presented itself. Now it's time to take it.

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NICOLAS HEFFERNAN

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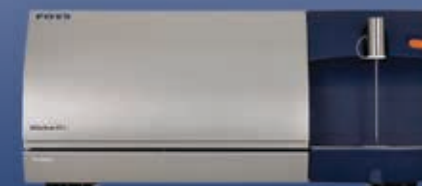


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Department of Food and Bioproduct Sciences
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BUILDING OFF THE SUCCESS OF OUR INAUGURAL ISSUE OF *CANADIAN FOOD INSIGHTS*, I'd like to welcome all industry, university and government members to the second edition of CIFST's official publication for Canada's food and beverage sector.




This issue gives the first comprehensive look at the top ten trends emerging for 2014 for the Canadian food industry, and showcases some recent success news from our membership. I'd like to draw your attention to some of our featured technical reviews on hot topic areas within the Canadian food and beverage sector. These include: 'Ideal grain ingredients: breeding wheat for health', highlighting the importance of healthy grains in our diet; 'The future of the Canadian Oilseeds Industry' which highlights the potential of oils and co-products of current and emerging oilseed crops; and 'Potato Utilization in Canada', which highlights advances within various parts of the potato processing sector. We also take a closer look at the potential impact of regionally based food clusters for research and innovations.

Based on valuable feedback from our readers, we have launched a new section entitled, 'Strategies for Moving Forward', which provides advice on ways small and medium-sized enterprises can prosper in an ever changing landscape. Our first addition to the series focuses on strategies for small companies to capitalize on some of the infrastructure, expertise and innovations available across Canada to help them grow.

So sit back with your double double, and enjoy the read! Canada has a lot to offer.

Sincerely

MICHAEL T. NICKERSON, PH.D., P.AG.

food EVENTS 2013	 November 12, 2013 <i>CIFST Annual Suppliers' Night Table Top</i> INTERNATIONAL CENTRE, TORONTO	 November 18-19, 2013 <i>P&F's Flavorcon</i> ATLANTIC CITY, NEW JERSEY	 November 22-24, 2013 <i>Whole Life Expo 2013</i> METRO TORONTO CONVENTION CENTRE

AGRI-FOOD INDUSTRIES ARE SPLIT ON CETA

The new Comprehensive Economic and Trade Agreement (CETA) with the European Union (EU) has split agri-food interests in Canada.

The agreement still has a few details to be worked out and could take up to two years to be ratified but when completely

implemented, the CETA is expected to result in \$1.5 billion in new agri-food exports including \$600 million in beef, \$400 million in pork, \$100 million in grains and oilseeds, \$100 million in sugar containing products, and a further \$300 million in processed foods, fruits and vegetables according to the Canadian Agri-food Trade Alliance.

Discussions around CETA have been ongoing since 2009, and reported breakthroughs on meat and dairy issues in September have allowed Canada and the EU to move forward and finalize the agreement. But both sectors have had different reactions.

Canada Beef is celebrating the announcement that will give the sector broader trade access in European export markets. The European market holds great opportunity for Canadian beef and veal, with the potential for 64,950 tonnes of duty-free market access for Canadian beef and veal worth over \$600 million.

"Canada Beef is positioned to work with our trade partners to take advantage of the new export opportunities in Europe. We are committed to the Canadian beef brand and will continue to foster strong partnerships in Europe to increase demand for our beef," said Rob Meijer, President of Canada Beef.

Canada will gain unlimited duty free access to the EU with live cattle, genetics, most offals, tallow and rendered products, processed beef products and hides and skins effective immediately. The Western Grain Elevator Association and the Wild Seafood industries are also among the groups to endorse the new pact.

But the deal has left a bitter taste in the mouth of dairy farmers, particularly for cheese makers. The deal would give the EU an additional exclusive access of 32% of the current fine cheese market in Canada.

The Dairy Farmers of Canada said in a statement they are "angered and disappointed with this news as the reality is that Canada would lose its small, artisan and local cheese makers and a world-leading industry with top quality products — within a short time frame."



Mac's Lobbies for Reformed Sales of Alcohol with Promise of New Stores, Jobs

IF GRANTED THE RIGHT TO SELL BEER, WINE AND SPIRITS at its 547 Ontario locations, Mac's Convenience Stores Inc. would build 27 new, ultra-modern, \$2-million stores within two years. The new stores would represent "\$54 million of new, private investment in Ontario," says Tom Moher, the company's Vice-President of Operations for Central Canada. "And that doesn't begin to include the millions of dollars Mac's will spend retrofitting our current stores for the sale of alcohol."

Mac's and the Ontario Convenience Stores Association are calling on the government of Ontario to expand the province's alcohol retailing system. A survey by the Ontario Convenience Stores Association (OCSA) found that 67 per cent of Ontarians want to be able to purchase beer, wine and spirits at their local convenience store. "Basically, the people of Ontario are telling their politicians that it's time to modernize alcohol retailing in this province," Moher told a business audience during a speech to the Toronto region Board of Trade. "Some of our politicians get it. Others — not so much. That's why Mac's is making this such a public issue."

The Mac's stores to be built under an expanded alcohol retailing system would be similar to the company's facility in Thamesford, one of two Mac's "agency" stores in the province permitted to sell alcohol. The Thamesford store opened in December, 2012 at a cost of \$3 million. (The other Mac's agency store is located in Craileith.)

The new Mac's stores will be built in Toronto, Brampton, Grey Bruce, The Muskokas, London and Ottawa, among other locations. They'll create up to 170 new, full-time jobs, in addition to the 1,600 jobs that will be created at existing Mac's stores once the right to sell alcohol is received, the company says.

food
EVENTS
2014

January 21-23, 2014

Banff Pork Seminar

BANFF CENTRE,
BANFF, ALBERTA

January 28-30, 2014

International Poultry Expo and
International Feed ExpoGEORGIA WORLD CONGRESS CENTRE,
ATLANTA, GA

January 30-February 2, 2014

Guelph Organic Conference

UNIVERSITY OF GUELPH,
GUELPH, ON

February 19-20, 2014

Ontario Fruit and Vegetable Convention

SCOTIABANK CONVENTION CENTRE,
NIAGARA FALLS, ON

February, 2014

Canadian Federation of Agriculture
Annual General Meeting

HOTEL HILTON LAC-LEAMY-GATINEAU, QC

February, 2014

Annual Meat Conference

NASHVILLE,
TNCanada Beef
Realigns to
Maximize Asian
Opportunities

IN ORDER TO STRATEGICALLY ALIGN THE CANADIAN BEEF CATTLE INDUSTRY IN THE ASIAN MARKET, Canada Beef is positioning its operations in the region to maximize current export opportunities and set the industry for future growth.

“The Asian market continues to be an important market for Canadian beef and veal exporters providing opportunities to increase carcass values across a wide variety of product types and diversify our customer base,” says Chuck MacLean, Canada Beef Chairman. “Many regions of Asia are poised for vigorous growth and will only become more important to the Canadian industry going forward. Canada Beef will be strategically aligned with our Canadian packers and exporters

to identify priority and emerging Asian markets and be properly positioned to deliver on the industry’s needs.”

In response to changing market access and demand trends and opportunities, Canada Beef continues to evaluate its marketing strategy, organizational structure, and resource allocations in order to position itself to maximize its return on cattle producers’ check-off investment. Consequently, a number of changes are being made to Canada Beef’s Asian operations to position the Canadian beef industry for future success and growth.

Canada Beef recently adopted a ‘hub approach’ in the Asian markets with senior leadership in Asia overseeing coordinated marketing efforts across the entire region. This has allowed the regional offices to increase efficiencies, market intelligence and program alignment, and program execution. Canada Beef is also working with the federal government to better utilize existing in-market resources such as embassies, consulates and the Canadian

trade commissioners to promote and market Canadian beef more effectively.

“Based on projected cattle marketing and the wind-up of industry development funds, Canada Beef knows that revenues for industry marketing and promotion activities will be significantly reduced in the next few years,” adds Canada Beef President Rob Meijer. “Therefore, we are taking proactive steps to ensure Canada Beef’s limited resources are targeted in the right markets and with the right customers to bring the greatest return on producers’ investment.”

In 2012, Canada exported 37,816 tonnes of Canadian beef and veal valued at \$175.6 million to Asian markets. From January to July 2013, Canadian export volumes are trending up 54 per cent and value is trending up 95 per cent.

Canadian beef and veal exports to all markets outside of Canada in 2012 represented 30 per cent of the total carcass value or about \$462 per head on average.

HIGH-QUALITY DIETS SUSTAIN
AND IMPROVE BRAIN HEALTH

There is a wealth of evidence to show that a healthy, balanced diet supports life-long brain health. In fact, scientific evidence indicates that a healthy diet — that includes whole grains, vegetables and fruit — helps maintain brain function, slow memory decline and may help reduce the risk for Alzheimer’s disease.

“Canadians of all ages can benefit from making a stronger connection between

how our diet impacts our overall brain health, how it ages and how we learn,” says Dr. Greenwood, senior scientist, Rotman Research Institute at Baycrest, Professor, Department of Nutritional Sciences, University of Toronto and new advisor to The Healthy Grains Institute (HGI), a not-for-profit organization that shares leading scientific research to help Canadians make informed decisions about the food they eat. “A healthy diet, coupled with a healthy lifestyle, helps decrease our risk of chronic conditions, such as diabetes and cardiovascular disease — which

contribute to poor brain health.”

Studies have found that older adults who consume the nutrient-rich diet recommended in Canada’s Food Guide have better levels of cognitive function. Consuming a high-quality diet also provides abundant fuel, strengthens blood vessels, nourishes areas of our brain, protects our body and brain against inflammation and oxidative stresses, and promotes the growth of new brain cells and neural connections.

FUNDING LOCAL FOOD
IN ONTARIO

From growing local foods to serving them at the dinner table, Ontario is making an effort to bring locally grown products to residents with the newly formed Ontario Food Fund.

The fund is part of a \$30 million dollar investment to support innovative projects that will increase awareness, access, and demand for food that is grown and harvested in the province of Ontario. As part of a broader local food strategy, Ontario recently also introduced Bill C36, Local Food Act, which if passed, will help increase awareness, access to, and demand for local food in Ontario.

The food fund will support projects divided into four categories: regional and local food networks, enhanced technologies, research and best practices and education/marketing and outreach. After three years the government of Ontario is hoping to see an increase of the access and sales of locally grown foods as well as local food awareness.

“Eating local isn’t just good for Ontario families — it’s good for our economy. That’s why our government will continue to work with the agri-food sector, including retailers and food service operators, to bring more Ontario food to the table,” said Kathleen Wynne, Premier and Minister of Agriculture of Food.

PEOPLE PROFILE

What’s in your
food?

BY NICOLAS HEFFERNAN

WHEN ISABEL HOFFMANN’S DAUGHTER GOT SICK, SHE HAD TO MAKE A LOT OF DIFFICULT DECISIONS.

With her child bedridden for more than a year because of severe food allergies, Hoffmann quit her job as CEO of a technology company to care for her daughter. When she found her daughter was also allergic to the mold in the house, they moved.

After a year of tackling the problem, her daughter was better and Hoffmann’s next choice was much easier. She decided to develop the world’s first handheld device that scans food for nutrients, calories, allergens, chemicals, identifies sensitivities and toxins, and spots potentially harmful ingredients.

“The inspiration was really my daughter,” she says. “There are many, many people out there like my daughter suffering from all sorts of allergies like food dyes and gluten, to name a few. It became important to figure out how one could build a device that actually could help people like her.”

She set out to create the “true Internet of food” after convincing her longtime friend and colleague, Dr. Stephen Watson, to help. Spectrometers have largely been big, bulky and expensive instruments ill-suited for a small handheld device but Hoffmann found numerous companies building spectrometers on a chip, including one in the Toronto area. The hardest part was devising an algorithm to make sense of the data. “The uniqueness to this is not really the spectrometer,” says Hoffmann. “The uniqueness to us is the way we actually analyze the data because that’s what people are not doing.”

After food is scanned by the device, the data is sent via Bluetooth to the user’s smartphone. Once the smartphone receives the digital spectrum of the food, it transmits it to the TellSpec analysis engine in one of our servers, which processes it, compares it to reference spectra, and runs a complex 50,000-line algorithm on it. The output is interpreted through a large database, and information about the food is selected and customized for the user. The smartphone then downloads the information from the server and displays it to the user. “The uniqueness we have to offer is we’re able to get a fingerprint from the mixture of the food,” says Hoffmann.

Instead of seeking private funding, Hoffmann and Watson put TellSpec on Indiegogo, a crowd funding site. This has the added bonus of data gathering. “We’re not just raising money, we’re actually getting people to use our Tellspecs and to do scans and every time they scan it benefits everybody because our algorithm is learning from what they scan,” says Hoffmann.

Hoffmann believes this tool will allow food manufacturers to scan their food much more quickly and efficiently. “Food manufacturers will be able to give much better products to consumers because they will be able to scan their food for everything,” she says.

Those who order the Tellspec now on Indiegogo will receive the product by next summer with it on the market for consumers by the end of 2014.



February, 2014

Canola Council of Canada
Conference

SAN ANTONIO, TEXAS

March, 2014

Growing the Margins
Conference

HILTON HOTEL, LONDON, ON

March, 2014

Annual North American Food
Safety Summit

DELTA TORONTO EAST, TORONTO ON

Canada's First Ready-to-Drink Protein Shake Made with Fresh Milk Launched by Saputo

Seeing an opening in the market, Saputo responded by launching the first ready-to-drink protein shake made with fresh milk.

"People are increasingly mindful about their protein intake, but are often pressed for time or unsure about what to consume post-workout to ensure proper recovery," says Philippe Duhamel, Marketing Manager at Saputo Dairy Products Canada G.P. "Many products currently on the market contain many undesirable ingredients such as vegetable oils and require considerable time to measure and mix. Milk2Go Sport was formulated for on-the-go people who are looking for a great-tasting product that is high in protein with the natural goodness of milk."

Athletes such as Ottawa Senators captain Jason Spezza, soccer star Patrice Bernier, as well as Canadian freestyle skiers Chloé, Justine and Maxime Dufour-Lapointe, have already made Milk2Go Sport a part of their training regimen.

"I've tried many different protein drinks and Milk2Go Sport is the perfect kind of fuel to help keep my body going," says Spezza. "With 26 grams of protein, it definitely helps me recover after a tough workout, but I also like it because it tastes much better than other protein drinks."

26 GRAMS OF PROTEIN

COMPANY PROFILE

Rising like a Phénix

PROVIGO WINS PHÉNIX DE L'ENVIRONNEMENT
AWARD WITH SUSTAINABILITY PROGRAM

BY NICOLAS HEFFERNAN

ONE OF ITS BIGGEST CHALLENGES TURNED INTO A BIG REWARD FOR PROVIGO, a member of Loblaw Companies Ltd.

Loblaw has been working since 2009 to sell only sustainable seafood in stores by 2013 with its Oceans for Tomorrow program.

"Gaining consumer engagement on sustainable seafood has been one of the biggest challenges in our commitment; this is part of the reasoning behind bringing the Oceans for Tomorrow campaign to life," says Melanie Agopian, Senior Director, Sustainability, Loblaw Brands.

But the company's work has been recognized with a 2013 Phénix de l'environnement prize in the environmental achievement category for the Oceans from Tomorrow program. "It is truly an honour to have our efforts in generating awareness for sustainable seafood recognized by a program as prestigious as the Phénix de l'environnement," says Agopian.

Loblaw created the first Canadian national retail campaign for promoting sustainable seafood certified by the Marine Stewardship Council (MSC). The Oceans for Tomorrow campaign has raised awareness of the MSC's ecolabel – and the mission to protect the health of the world's oceans by recognizing and rewarding sustainable fishing practices – reaching 11 million households. Loblaw and its banner stores carry the widest range of MSC-certified seafood in Canada. "Oceans for Tomorrow drove an increase in both sales of MSC-certified sustainable seafood products and consumer awareness of the MSC ecolabel," says Agopian. "We are very pleased with these results and hope to continue to drive consumer engagement on this important issue."

Despite the progress there is still room for improvement. "Sustainable seafood has increased in priority for our shoppers in the last two years," says Agopian. "We need to continue to educate our customers about the importance of sustainable seafood practices to ensure the future health of our oceans. Awareness and education will drive change."

Oceans for Tomorrow and the sustainable seafood campaign affects all wild and farmed seafood – including seafood as an ingredient – in any product throughout the store. Other proteins like chicken, beef and pork, have other sustainability targets that are reflected in the company's Corporate Social Responsibility report, which includes local sourcing and animal welfare.

"As Canada's largest grocery retailer and largest buyer and seller of seafood in Canada, we believe we have a responsibility to educate our customers about the importance of sustainable seafood so they can make informed choices that will benefit our oceans," says Agopian.



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SOBEYS GETS IN BED WITH THE NAKED CHEF

SOBEYS' VP OF BRAND MARKETING ON WORKING WITH JAMIE OLIVER AND MANAGING A CHANGING BRAND

TEXT BY THERESA ROGERS

IN AUGUST, SOBEYS ANNOUNCED A PARTNERSHIP WITH WORLD-RENOUNDED CHEF AND HEALTHY EATING ADVOCATE JAMIE OLIVER. The nationwide grocer says it wants to educate, inspire and empower Canadians to eat better. We wanted to know more so *Canadian Food Insights* spoke with Gillian Kerr, VP of Brand Marketing at Sobeys.

Why is Sobeys embarking on this partnership with Jamie Oliver?

As you know, Sobeys has launched a new brand positioning which is summarized with our new tagline, "Better food for all." It's about a mission, a journey that we're beginning to bring better food to Canadians. We see what Canadian consumers want in terms of better food basically in four areas: a demand for fresh, quality food. Second, desire for sustainable food products. Third, a desire for healthy and wholesome products, and fourth, ways to save time and cook with ease. Many Canadians are managing special diets due to a medical condition or their own diet due to some of their food choices, and they want stores and

food sources that can help support that and they want all of that and they don't have a lot of time to do it so finding solutions that are fast and quick and easy. We see better food as certainly being wholesome and you can see that through those four areas.

As well, we know that Canadians have a great passion for food. It's about enjoying food so when we looked for how we wanted to communicate this, we were looking for someone who was aligned with that viewpoint and the values that we had with the better food for all platform. That's why Jamie Oliver was kind of a natural for us. He is interested in sustainable food products. He is interested in food that is healthy and wholesome, food without a lot of preservatives or additives or even overly processed but of course, he's definitely interested in food that tastes great and new ideas. He's passionate when he talks about food and he also knows that consumers need tools and tips and recipes that can deliver that quickly as well. He's very much aligned with the way we see better food and it made him a great fit for us.

I know you've just introduced the partnership. The tools and tips and recipes will be forthcoming?

Yes, well the first area he helped us with was in the area of sustainability and I would say the main areas that he's helping us with are sustainable products and the advancement of cooking

skills. I invite you to go to sobeys.com to see how his team has teamed up with Sobeys' team and together have been able to bring the offer of Certified Humane chicken, beef and poultry. We've been told by the Certified Humane people that we are the first North American retailer to do this. We've been working on this with Jamie's team since last January in order to understand what a good protocol would be. They helped us partner with the Certified Humane group and together, find producers who were raising food according to these standards. We're very pleased to launch this product offering and our customers have really appreciated it and have told us that through the sales of product as well as other commentary.

Does it matter that he's not Canadian?

We certainly asked ourselves that question. We wanted somebody who was aligned to our values and had the ability to tell our story. We were looking for a good communicator. We researched 10 chefs that were from the Food Network. There were three British chefs, three



Canadian chefs and four American chefs and he was number one in terms of general likability and number one in terms of alignment to the values that we were aspiring to and certainly top three in awareness.

Who were they rated by? Did you go out to consumers?

Yes, it was a consumer panel and it was all across Canada and it was interestingly, pretty even across Canada and pretty even male and female.

How long was that process of research and selection?

We've been working on this for about a year.

I saw the Jamie Oliver commercials a few times right after your initial announcement and haven't seen them since. What is the process of relaunching a brand?

It's incremental and you will see that spot again. It certainly will be in rotation but it's really to do the job of announcing our mission and announcing our partnership. This holiday you'll see a new message about a different product offer and Jamie will be the spokesperson for Sobeys on that. So to answer your question, we're announcing the partnership and the first proof point to bring better food to Canadians was the Certified Humane offer. We also had many other product launches around that: artisan breads and produce programs. It's really about new product programs, new store services, new seasonal tips, recipes, information, and it's about rolling out the pieces of the offer as they are relevant to customers in a seasonal timeframe.

How are you making consumers aware of this offering and this program? Are you focusing on customers that you already have or are you looking to acquire new customers and how are you reaching them?

Television is an awareness medium. We want the marketplace at large to be aware of how Sobeys has changed. Of course, supermarkets use flyers so some of the details of our offer are there. We have a new insert called Better Food News where we're talking more specifically about some of the products aligned to the better food for all platform so there's more information

there about Certified Humane and some of the produce items like our Ripe and Ready Avocados, tomatoes that have a range of sweetness, a potato by usage program where you can choose the potato by your usage needs – boil, baking, roasting, etc. We've also relaunched our website so there's a lot more product information on there than there was on the last iteration of our website.

The reason that I ask is my local Sobeys closed recently. If I didn't see your press release or commercial, I would never have known.

[Supermarkets are] a local business. Obviously we're not going to serve every local community but we chose television because there are certainly enough Canadians and enough Sobeys and we wanted them to be aware of our message.

Where will Safeway fit into this new brand and how will that transition be managed?

That's not part of the platform today and as the final deal is yet to be completed it's something that I won't be commenting on.

You mentioned the humane chicken, beef and pork. There are other stores that have similar programs around seafood, etc. How do you differentiate yourself from these other companies?

We have a Certified Humane certification which is a third-party certification that assures the customer that the brands that we have brought into our stores under this certification have been approved by a third party. It's right on the label for customers to see... We're the only North American retailer to offer this in all three proteins: chicken, beef and pork and that is a differentiator. Nobody else is doing that.

There's a lot of competition coming to the marketplace through various acquisitions, the arrival of Target, etc. How does all this competition affect your brand?

It's only pushed us. We have to be competitive so we have to find ways that we can differentiate. Even prior to the association with Jamie, we've been doing research to understand what Canadians



Sobeys and Jamie Oliver are on a mission to bring better food to Canadians.



Sobeys' "Eat Healthy" campaign includes Certified Humane beef, pork and poultry from suppliers such as Blue Goose.

want from their food sources and we know there is a desire for better food amongst Canadians. They want better sources, they want less processed food but they want it all to be easy, affordable and convenient to them and quickly accessible. That is the space where we're going to go and based on our research, what we want to offer customers.

Is there anything else you want to mention?

You asked how a brand is changed. It really is one proof point at a time. And just like anybody who's making changes, it takes a while for a business to make changes and we understand that our customers have different needs and everyone is at a different point on their better food journey. While some people are changing cookies for apples, other people want to eat organic every day and you have to meet both those consumers where they are. All this to say, we want to be a retailer of choice. We're not going to transform our business overnight but bit by bit, offer by offer, we want to offer Canadians more in the way of better food. ■

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EMERGING DEMAND FROM ASIA, CHANGING CONSUMER
DEMOGRAPHICS AND HEALTH-CONSCIOUS SHOPPERS
WILL SHAPE CANADIAN BUSINESS NEXT YEAR

TEXT BY NICOLAS HEFFERNAN

GLOBAL FOOD DEMAND IS
EXPECTED TO RISE

35%
BY 2025

IT WON'T BE EASY but 2014 could be a good year for the Canadian agri-food industry.

"I'm actually quite bullish on Canada," says Dave Donnan, partner and leader of Global Food and Beverage Sector Practice for A.T. Kearney, a global management and consulting firm. "I think Canadians have an opportunity to build on what has always been a very strong image but there's going to be lots of competition and particularly the other thing that's happening is a lot of private equity money is getting into the food industry as well, particularly in China and exports so it's going to be a challenge."

Donnan says Canada has the resource base to compete. "The question will be whether you can get the costs to a point where it's going to be competitive with others around the world."

Canada is very strong in areas like canola and wheat, but with certain products being more seasonal and recent incidents around beef, forecasters see room for Canada to improve. "I

think there are still opportunities for Canadian processors and I think Canadian retailers," says Donnan.

Following are 10 trends to look for in 2014.

SUSTAINED DEMAND FROM ASIA

Proteins

"There's going to be continued demand coming out of Asia as populations in China and India get better economics and more middle class," says Donnan. Global food demand, in general, is expected to rise by 35 per cent by 2025 from 2007 levels, with most demand coming from Asia. China and India alone could account for almost 60 per cent of the global increase. Donnan believes protein consumption will be the main beneficiary of that growth. "We're going to see higher demand for proteins – in China it will be for pork and chicken, in India it will be chicken."

That's going to have implications for food prices in North America as well as demand," says Donnan. For example, the recent purchase by Shuanghui of Smithfield Food's pork production has the largest Chinese pork producers buying a U.S. pork company. "Here will probably be more exports of pork products to China from both Canada and the United States," says Donnan.

Pricing pressure

Donnan says to also look for increased demand for commodities like edible oils which may put pressure on pricing from Asia. "We've actually had low prices this year [for commodities]. The commodities ramp-up that we saw in 2010-11 has abated because the weather has actually done OK but we may see some further upward pressure on prices – nothing too significant as it was two years ago – but there'll be some just because of increased demand out of Asia," he says.



"We're going to see higher demand for proteins — in China it will be for pork and chicken, in India it will be chicken."
—Donnan

CONSCIOUS CONSUMERS

Supply chain awareness

There will also be a continued focus by consumers on food safety, clean labels, organics and source of origin of foods. "People are just becoming much more aware of where their foods come from and wanting to make sure that they're healthy and safe and made from good ingredients," Donnan says.

Consumer health

North America is going to continue to be focused on healthy eating. "Obviously, with obesity, dietary management, things like that, people are spending a little bit more time trying to really focus on healthy products, but still at a reasonable price. We're not seeing a major increase in price sensitivity. People are very price conscious – looking for value but also looking for healthy food with value," says Donnan.

CONSUMER DEMOGRAPHICS

Packaging

Donnan says consumer demographics will influence the way people shop. With millennials (people born between the early 1980s and the early 2000s) and the boomers aging, these two major generational cohorts are having

a significant impact. Boomers' children have grown up, gone to school or gone off to work resulting in a lot of single and couple households. Millennials are delaying marriage and kids often until their early 30s, which also creates a lot of single and couple households. Now one- and two-person households outnumber the traditional family of four. "The entire food industry is having to rethink their positioning of packaging of products to more meet the needs of singles and couples than it has in the past," says Donnan. "The family style, the family-sized things although still available, are much less in demand than they were in

the past. A package will be focussed on one or two meals and not a meal for four."

Grab and go

Both men and women in the millennial and boomer generations are working, meaning they have less time to cook and when they do cook, they don't want to make a big meal. "There's a lot more of what I would call grab and go – fresh prepared meals, meals where you can

just go and pick them and they're already prepared whether that's take out or it's going to a grocery store and picking something up... that you can take home and reheat," he says.

AMERICAN INVADERS

With U.S. retailers continuing their push into Canada, there could be a trickle over effect for the food industry. "From a food perspective, if you look at Canada, Loblaws has done great, Sobeys has done great... so there's a lot of movement going on," says Donnan. "I think the Canadian food industry is pretty good although people in Vancouver are wanting Trader Joe's to come on up so there's that kind of want for some variety and different types of food as well." He adds, Canadians may be looking for more innovative retailers that are coming out of the United States like Wegmans, Trader Joe's and Mariano's in Chicago that are all offering prepared meals, grab and go foods and chefs inside stores.

The need to innovate and market and cater to consumers is leading companies to develop healthier versions of existing products.

FOOD JUSTICE

Consumers paying more attention to the food they're eating combined with the multiple means of communication means NGOs are having an increasing impact. "The non-governmental organizations, whether it's looking at GMOs, food safety, the ethical treatment of animals, gestation crates for pigs, all of those things are becoming much more trend-centred," says Donnan. "It is not so much that people have changed attitudes, but communication has changed so when something happens it creates a wave on Twitter or Facebook so there's a lot more tension and scrutiny toward food justice."



THE LITTLE GUY

With Loblaws and Sobeys recently buying Shoppers Drug Mart and Safeway respectively, Donnan looks at consolidation as a natural evolution. "Consolidation occurs in every industry and usually what happens is there's a consolidation of middle-sized players and then large companies come in. But at the same time, smaller companies start to emerge because often

large companies will have gaps in their service so I just see it as a refreshing of the dynamics of the industry," says Donnan. "I see it as a resurgence of some more competition and hopefully it's more innovation."

GOVERNMENT/INDUSTRY COMPLIANCE PARTNERSHIP

The government's dilemma is it wants to make sure food is safe and regulated properly, but government is dedicating less money to compliance enforcement. "I think there's going to have to be a partnership between industry and government," says Donnan. "Large companies don't want to have a product on the market that's not safe; they don't want to have a product on the market that's unhealthy.

WHEN SOMETHING
HAPPENS IT
CREATES A WAVE ON
**TWITTER OR
FACEBOOK.**
THERE'S A LOT MORE
TENSION AND SCRUTINY
TOWARD FOOD JUSTICE.

They want to do what they have to do to make sure that consumers are happy, healthy and continue to purchase things from them. At the same time, government is going to have to watch out for things that could go wrong. It can only work with government and industry working together because the government doesn't have the resources nor the revenue to do all the compliance that is necessary to enforce the regulations."



RESURGENT CEREALS AND SNACKS

Cereal, candy, ice cream and snack food production are anticipated to experience revenue growth in 2014 in Canada and the U.S. according to Jeffrey Cohen, an analyst at IBISWorld, a leader in market research reports. "Both countries are experiencing growth in per capita disposable income as both economies experience recovery and so as consumers have more income, they increase spending on food items that they curtailed spending on during tougher economic times," he says. "That is benefitting these industries," which are growing despite the trend of health-conscious consumers. "These are still staple items that consumers purchase and the more money they have, the more sales that companies that operate in these industries rack up." But companies in these areas aren't ignoring health-conscious consumers; they're actually trying to cater to them. "Certain products within the industries like some of the more sugary cereals sales are declining but at the same time, organic cereals are experiencing increases and those cereals are marked up at higher prices than your typical Frosted Flakes or Lucky Charms," he says. This applies to candy as well.

REFINING PRODUCTS

The need to innovate and market and cater to

consumers is leading companies to develop healthier versions of existing products. "Companies that produce products that consumers have been purchasing for years... when [consumers] see that these companies are very understanding of what consumers want and are able to adapt their product lines to meet demand for items such as gluten-free products, organic products, natural products, by appealing to what consumers want, they end up experiencing an increase in sales. Because the trend seems to be that consumers are purchasing more organic products and gluten-free and natural food products, those companies that jump on board are benefitting as a result," says Cohen.

DECLINING MEAT SALES

There is bad news for one sector with meat and beef processing in Canada and the U.S. expected to undergo a decline in sales, says Cohen. "Even though both economies are experiencing a recovery and per capita disposable income is going up, there is a decline in per capita meat consumption due to the negative perceptions of red meat in diet, associated with high cholesterol and heart disease. As a result, consumers are looking at alternative diets... vegan and vegetarian options and fish as well." ■

THE GOVERNMENT'S
DILEMMA IS IT WANTS TO
MAKE SURE FOOD IS
SAFE AND
REGULATED
PROPERLY,
BUT GOVERNMENT IS
DEDICATING LESS MONEY TO
COMPLIANCE ENFORCEMENT.

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BUGGING OUT

A TEAM OF MCGILL MBA STUDENTS
WINS THE PRESTIGIOUS HULT PRIZE
FOR USING INSECTS TO HELP SOLVE
THE GLOBAL FOOD CRISIS

TEXT BY NICOLAS HEFFERNAN



THE ANSWER TO SECURING FOOD for the impoverished and undernourished: grasshoppers, palm weevils, caterpillars, and water beetles.

Don't worry if it takes you aback, it took the captain of the team who is bringing the idea forward time to get his head around it too. But about a year after embracing the idea, Mohammed Ashour and a team of four other McGill University MBA program participants won the prestigious Hult Prize, a year-long social-entrepreneurship competition involving thousands of students from around the world. The team also cashed in on the prize's \$1 million jackpot to help implement a plan to formalize the existing informal insect markets around the world and promote innovative insect farming practices in order to provide year-round access to nutritious insect foods.

Even Bill Clinton admitted it's a difficult idea to accept when he presented Ashour, Gabriel Motte, Jesse Pearlstein, Shobhita Soor and Zev Thompson, who started a company around their winning plan called Aspire Food Group, the award in September. The McGill team beat out 10,000 competitors including five teams from South Africa, Shanghai, San Francisco, Dubai and London in the finals in New York at the annual Clinton Global Initiative annual meeting. "This is really serious," he said. "If I said to somebody 60 days ago I'm going to give this prize this year to someone who wants to process and sell edible insects – to empower rather than devour – they'd have laughed."

DAUNTING CHALLENGE

When Ashour received the challenge of solving the global food crisis in August 2012, he immediately started putting together a team that could compete. "There was a deliberate and conscious effort to select a team that has a sort of diverse portfolio," he says. Ashour reached out to Motte first, who he had befriended over the first few weeks of the program and became the group's strategy and implementation specialist. Over time the duo recruited Pearlstein who had expertise in finance, Soor for her legal acumen and Thompson as a serial entrepreneur.

But finding a solution with the potential to win the prize proved elusive. "We knew... it would have to be a revolutionary concept," says Ashour. The team went off in different directions, spoke with different people and tried to stimulate conversations to think of a unique answer. One of Ashour's friends mentioned in passing, "By the way, in some parts of the

world there are people who consume insects.' At the time I remember being very dismissive and disgusted by his suggestion. Having said that, I couldn't let go of the idea. It was definitely intriguing and I decided to go home and do some research about it," he says.

According to a recent report by the UN's Food and Agriculture Organization, 2.5 billion people eat insects seasonally worldwide. Insects are also much more environmentally friendly than traditional livestock, producing far less greenhouse gas emissions and requiring less land and water to farm. They are also much more economically viable than traditional livestock. For example, crickets need 12 times less feed than cattle, four times less than sheep, and half as much as pigs and broiler chickens to produce the same amount of protein. "The minute we discussed it as a group everybody immediately jumped to their feet: This is it! This is the idea that's going to create that kind of impact," he says. "It really quickly emerged as a feasible, not just feasible, but a fairly executable and innovative idea and that's how we developed it from that point onwards."

But with insect consumption being around for millennia and insect farming for centuries, the challenge for the McGill team wasn't trying to alter people's palettes but correct market imbalances. "There are so many people around the world who actually consume insects on a regular basis and their problem is one of seasonality and affordability," says Ashour. "They're not getting enough of these insects in their diet because they're only available for a short period of time and when the insects are available they're very expensive. By essentially increasing the supply and stabilizing access to these insects we should see a massive change in people's caloric intake and nutrition intake at the same time."

The team took the idea of consuming insects and turned it into a viable business solution by trying to formalize a fragmented market. "To do that we had to come up with ways we could monetize this project but at the same time keep it a social enterprise – at the heart of which there is this concern and commitment to do good while doing well at the same time," says Ashour.

THE SOLUTION

In a lot of places where insects are consumed, farming doesn't actually exist. The first part of Aspire's plan is empowering a network of peri-urban and rural farmers to actually farm insects in large quantities, who would sell them to a local hub managed by Aspire. The insects would



be boiled and dried to ensure they're sanitary and of good quality before being sold directly to a distributor who would package and sell to end users.

The group's plan has been modified many times since starting because of new research, information gleaned on their travels and time spent in a Boston accelerator program. One of their early plans was to take only crickets, but during fact-finding trips to places like Ghana, Thailand and Kenya, they quickly found that wouldn't work. "The reality is insect consumption patterns differ from region to region and just because it's a great product doesn't mean people are going to want to eat it," says Ashour. "Even though someone in Ghana eats palm weevils and they actually love them and they think they're delicious, if we tried to feed them crickets they're going to think they're gross."

Luckily, a lot of insects are fairly robust and versatile in their farming potential. "You can essentially use a very similar farming apparatus to farm crickets as you would grasshoppers as you would caterpillars as you would palm weevils," says Ashour. "It's not that we would need to invent something new every single market we enter. It's very likely we would only need to make slight modifications to our existing farming unit to adapt to local insects according to local geography."

THE FINALS

This was the idea that Aspire pitched at the final in New York. "You're talking about nine months worth of material, research, travel, findings, partnerships, all sorts of stuff you're trying to pack into a 10-minute tight pitch that really conveys the most potential meaning about everything you've been doing," says Ashour. "I would say we spent at least the month leading up to the final presentation just working on that."

Once the final date was near they rehearsed and tried to take the experience in. "The final two days were, that's it we've studied for the exam there's nothing else we can do. We're not going to cram... just soak up the fact that we're here in New York and part of this amazing opportunity irrespective of the outcome," says Ashour.

When the team won it was an exhilarating experience akin to one of the world's biggest sporting events. "We were all overcome with emotion and gratitude and humility and everything all at once and it was such an honour for us to have won in front of thousands of people around the world who were live streaming. From relatives, countries in the Middle East, to you're talking about our entire MBA program sitting in the lounge with a massive screen TV jumping up and down the minute they heard the announcement," says Ashour. "It really felt like this World Cup type of feel to it."

Adding to the occasion was the man who presented the award. "It was also probably the most humbling experience ever to hear that President Clinton specifically took some time to review our work and commented on just how big of a scale we were operating at and the type of catalytic impact our team's idea could have on the world," Pearlstein says.

A TALL ORDER

Aspire will be able to put the \$1 million prize to use quickly. With roughly four million people, Neza-Chalco-Itza on the outskirts of Mexico City is the largest slum in the world. "It has the double burden of undernourishment and obesity," says Ashour. "It really has an ideal resume so to speak for the type of solution we're providing." Thanks to partnerships struck on their travels, Aspire has a 10-tonne order of grasshoppers to fill for a Mexican distributor by next spring. "We already have farmers who

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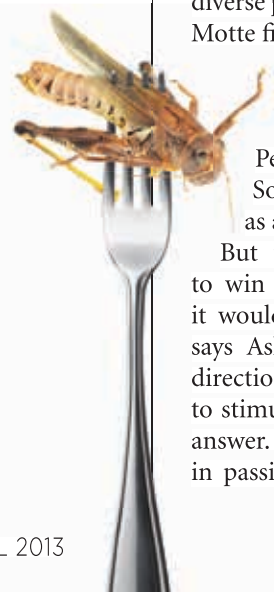
LEFT: Zev Thompson in a slum.
Photo credit: Gabe Mott, taken in Mathare, Nairobi, Kenya.

RIGHT: Chapulines on a tortilla.
Photo credit: Mohammed Ashour, taken in Oaxaca, Mexico.

OPPOSITE PAGE:

Mohammed Ashour looking for chapulines in a field.
Photo credit: Fondation Ayu, taken in Oaxaca, Mexico.

"Even though someone in Ghana eats palm weevils and they actually love them and they think they're delicious, if we tried to feed them crickets they're going to think they're gross."
–Ashour



are interested in beginning to farm grasshoppers,” says Ashour. “A lot of things are really lined up well in Mexico.”

But the team isn’t stopping with Mexico with an ambitious to plan to try and reach five countries and 21 million people in five years. The Hult Prize money will definitely help but because it’s released on a milestone basis and not as a lump sum it puts pressure on the team to hit their targets. “We obviously have a very ambitious and tight financial schedule,” says Ashour. “We have all these hubs that we need to set up, farming units that we need to complete the prototyping of and start deploying and selling. I mean, a million dollars sounds like a lot of money but if you’re trying to scale into five countries and reach 21 million people in five years, it’s really not a lot of money at all.”

The team is seeking as many partners as possible – not just financial – which are needed to scale the solution, but who also have resources and connections in the countries they’re

Thanks to partnerships struck on their travels, Aspire has a 10-tonne order of grasshoppers to fill for a Mexican distributor by next spring.

operating in. “We’re hoping once we have a certain degree of traction in Mexico that we’d be able to attract additional funding in order to really scale this thing as fast as possible,” says Ashour.

A HELPING HAND

Ashour happily admits the team wouldn’t be where it is right now if it wasn’t for McGill University. Without it they wouldn’t have been able to travel the globe to carry out the research that ended up informing and shaping the business plan. The McGill community, alumni and faculty invested directly into the team “with no holds barred, no strings attached, they just wanted to see us succeed,” says Ashour. From lawyers who helped set up Aspire’s incorporation, to the COO of a massive global marketing consulting firm who helped refine the team’s pitch to the professor who used his contacts to help Aspire set up in Mexico, people gave up their time to see this group succeed. “It was a hugely important resource that we had and quite frankly it would be difficult to say we would have been able to establish this level of success without the ongoing support of the McGill community,” says Ashour. He also singled out the Canadian Institute of Food Science and Technology’s Canadian breakfast at the International Food Technologists show in Chicago in July that helped make contacts that were a part of the team’s success. “The fact that Anton [Angelich, a McGill alumnus and speaker at the event] gave us the opportunity to speak at the breakfast was really great exposure for us,” says Ashour. “That was a very important event and we’re very glad to have been a part of it.”

There is no reason why there can’t be more Canadian success stories like Aspire’s. “We’re constantly surrounded by brilliant minds and brilliant ideas just at McGill University; imagine all the institutions and all the places throughout our country,” says Ashour. “Look what happened when a whole bunch of alumni came and said, ‘Look, this is a great team, we believe in them, let’s give them some money and some resources and let’s see how far they’re going to take it.’ And look how far we took it!” ■

BELOW:
Mohammed Ashour getting
up close and personal with a
chapuline.
Photo credit: Zev Thompson,
taken in Oaxaca, Mexico.

BOTTOM:
Photo credit: Gabe Mott, taken
somewhere in Thailand.



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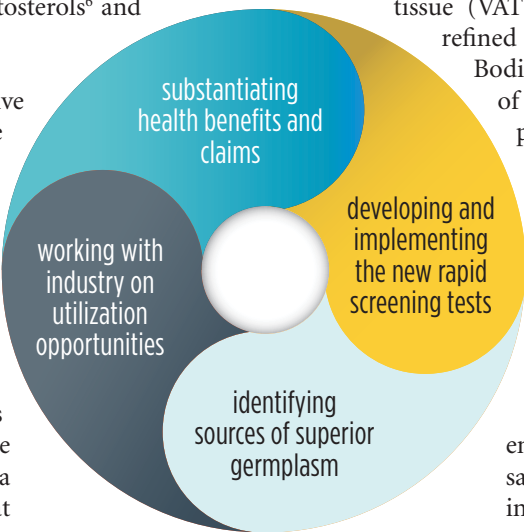
Ideal Grain Ingredients:

BREEDING WHEAT FOR HEALTH

NANCY AMES^{1*} | DYLAN S. MacKAY²

Wheat is the predominant cereal crop grown and exported in Canada. Wheat products are among the most widely consumed food products in the world, making them an excellent vehicle for providing nutrients to the population. Although wheat already offers many health benefits, in North America there is a lack of consumer awareness or misinformation about the healthfulness of wheat. Recent consumer trends towards gluten-free and wheat free diets may not be based on medical need or scientific validation indicating more effort is needed to highlight substantiated scientific information in the media. For example, there are many bioactive compounds in wheat that have potential health benefits that have been documented in scientific journals but are not necessarily known to the general public. Examples include betaine¹, lutein^{2,3}, phenolic acids^{4,5}, phytosterols⁶ and arabinoxylan⁷ and other fibres.

Many of these beneficial bioactive components are concentrated in the outer layers of the wheat kernel, reinforcing the importance of whole wheat intake. Wheat is a good source of the compound betaine which is concentrated in the aleurone layer, one of the outer layers in wheat bran. A four week human feeding study showed that including wheat aleurone in the diet increased betaine plasma levels and were accompanied by a decrease in LDL cholesterol¹. Arabinoxylan is a soluble fibre component present in wheat aleurone that has been shown to reduce glycaemic response⁷. Consumption of arabinoxylan enriched muffins and



Wheat breeding program research provides many benefits to community and industry partners

bread for 5 weeks lowered fasting glucose values in type 2 diabetics⁸. Other studies found that wheat germ consumption was able to reduce cholesterol absorption⁹, which may be due to its phytosterol content. Ferulic acid, the most abundant phenolic acid found in wheat, has been shown to have anti-inflammatory and anti-oxidant properties in animal and in-vitro models. In healthy men, consumption of a wheat bran bread processed to make phenolic acids more bioavailable, increased blood ferulic acid concentrations and may have positive effects on the immune system¹⁰. Furthermore, there are several recent epidemiological¹¹ and review^{12,13,14} papers that discuss the evidence for beneficial health effects of whole grain consumption, including wheat. For example, increasing whole-grain intake is associated with lower visceral adipose tissue (VAT) in adults, whereas higher intakes of refined grains are associated with higher VAT¹⁵. Bodinham et al.¹⁶ found that consumption of 48g of whole wheat fed for 3 weeks produced a significant reduction in systolic blood pressure compared to refined grain. In another study, a significant reduction in both total and LDL cholesterol was found with the consumption of a whole wheat diet¹⁷. These examples of documented nutritional benefits associated with specific wheat bioactives provide an opportunity for plant breeders to further enhance the healthfulness of wheat and satisfy consumer demand for ideal grain ingredients.

Currently, wheat breeding in Canada focusses on reducing plant disease and in-

creasing yield while maintaining the high milling and baking quality that defines Canadian wheat¹⁸. Modern wheat cultivars have been bred to meet the demands of the milling industry. Wheat quality testing is performed on the straight grade flour, and although over 50 quality traits are tested, none of them focus on nutrition. High yield and milling quality are undoubtedly important traits for wheat to possess, but it is also possible to focus breeding criteria on nutrition. For example, barley is primarily bred for the malting and feed industries but more recently breeding programs are focusing on nutritional traits and food quality. This is especially apparent with the development of a new food barley class of grain in western Canada and the recent approval of a health claim for cholesterol lowering by Health Canada¹⁹. The barley health claim is based on scientific data showing that consumption of at least three grams of barley beta-glucan a day can help reduce cholesterol. Beta-glucan is a type of soluble fibre that is found in both barley and oats.

The Canadian oat breeding program is also a good example of where yield, milling quality and nutrition have been considered collectively when developing new varieties. Oats have historically been bred for health traits such as high soluble and total dietary fibre with a focus on retention of the nutrient rich bran layers during milling. Industry and consumers recognise the nutritional value of oats, which is aided by well-established health and nutrient content claims²⁰. The context of the oat and barley breeding programs may serve as a guide for the wheat breeding program.

In order to add nutrition-based quality criteria into the wheat breeding program, support will be required from the research community and industry partners. Research can serve many roles: substantiating health benefits and claims, developing and implementing the new rapid screening tests, identifying sources of superior germplasm and working with industry on utilization opportunities. Methodology for measuring these traits must be established with the breeding system in mind; rapid testing and high repeatability are crucial to handle the large sample quantities. In addition, knowledge of the genetic control over a particular trait can aid in breeding progress and is useful in overcoming technical challenges such as genotype by environment interactions. For many traits, much of this information as well as data showing evaluation of diverse germplasm already exist. For example, lutein shows wide genetic variation and has been found in particularly high amounts among certain durum and hard red spring wheat germplasm. Industry already plays an important role in creating market opportunities for wheat as a healthy food ingredient. The industry's close relationship with consumers puts them in a unique position to increase consumer knowledge of the health

benefits of wheat. Consumers who become aware of the health benefits of wheat will then in turn create end-user demand for nutritionally superior varieties.

Wheat is the major cereal grain grown and exported from Canada. This means that wheat has the largest platform on which improvements to its nutritional traits can impact consumer health. Wheat is already nutritious, but the potential exists to make wheat even better through a wheat breeding program that focuses on nutrition, as well as yield and milling quality. ■

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Future of the Canadian Oilseeds Industry

RICK GREEN*

The Canadian oilseed industry is an important economic driver for both our Agriculture and Agri-food sectors. Oilseeds are primarily grown for their oil content, which range in levels from 20% in the seeds of soybeans to greater than 40% for some canola and sunflower varieties; however other seed components, such as fibre, and protein by-products offer significant potential for both food, feed and industrial applications. The total oilseeds production in Canada in the 2011-2012 crop year was 22.4 million MT with canola dominating production (14.6 million MT) followed by soybeans (4.3 million MT), and flaxseed (0.4 million MT)¹. Canada's 13 crushing and refining/packaging plants have the capacity to crush about 8 million tonnes of canola seed, and in 2011-2012, produced 3.1 million tonnes of oil and 3.9 million tonnes of meal^{2,3}. Further refining improves the colour, flavour and shelf life of canola oil. Canola oil is recognized by industry for its good stability during cooking and its nutritional attributes. A recent study the canola industry's overall contribution to the Canadian economy was valued at greater than \$19 billion². The main Canadian oilseed products are oil for human consumption and meal for livestock feed. However, new oilseed crops are in development in Canada and are targeted at food, biofuel and industrial uses.

NUTRITIONAL IMPORTANCE

Oilseed (i.e. vegetable) oils are comprised of fatty acids attached to a glycerol 'backbone' structure. These types of fatty acids determine whether a vegetable oil is used for edible or industrial purposes. Fatty acids are classified based on whether or not the

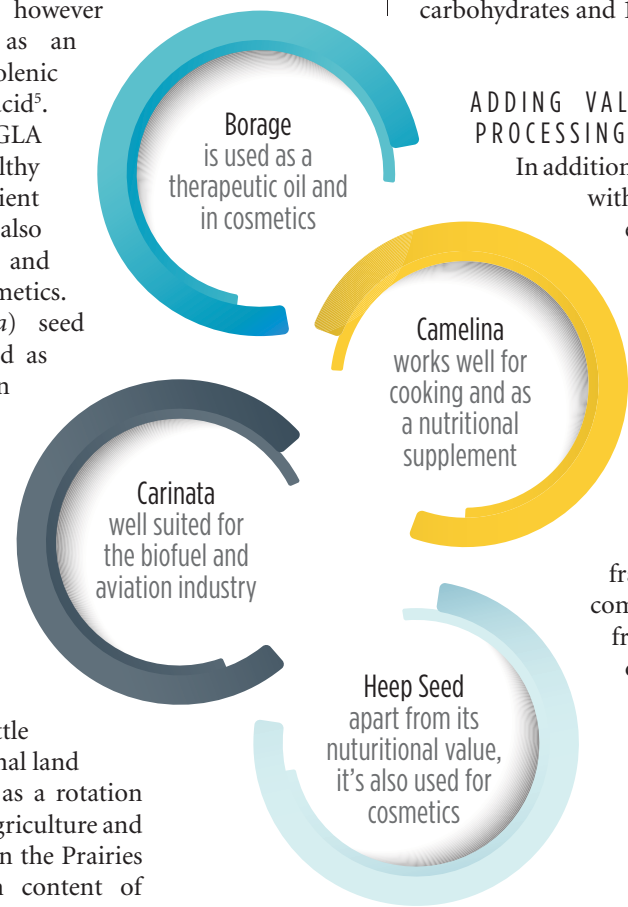
fatty acid carbon chain contains no double bonds (saturated fatty acid, SFA), one double bond (monounsaturated fatty acid, MUFA) or more than one double bond (polyunsaturated fatty acid, PUFA). The PUFAs are further classified based on the position of the first double bond from the methyl terminal end of the fatty acid as n-6 (omega-6) or n-3 (omega-3) fatty acids. Humans are unable to synthesize n-6 or n-3 fatty acids, thus these fatty acids are essential dietary nutrients.

One of the major trends in the oilseed processing sector in Canada is optimizing the nutritional value of oils by increasing the n-3 (omega-3) fatty acid, particularly alpha-linolenic acid (ALA), content in oil and in our diet. There are three main types of n-3 fatty acids; ALA, docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA). ALA is an essential fatty acid and must be consumed in the diet. It can be converted into DHA and EPA although this conversion is very limited. Certain vegetable oils such as canola oil and flax oil are rich in ALA whereas some fish oils are rich sources of DHA and EPA. The major n-6 is oleic acid and this fatty acid is present in high amounts in canola oil, mid-oleic sunflower, high oleic soybean oil, and certain nut oils. The n-6 and the n-3 fatty acids are important in many aspects of health. The n-6 fatty acids are known to reduce low density lipoprotein and overall cholesterol and to help reduce the risk of cardiovascular disease and stroke, if consumed on a regular basis⁴. The n-3 fatty acids are of importance for reducing cardiovascular risk, in neurological function, and in inflammatory and immune disorders. The Association of Dieticians of Canada recommend that dietary fat for the adult population should provide 20% to 35% of

energy and emphasize a reduction in saturated and trans-fatty acids as well as an increase in n-3 unsaturated fatty acids⁴. Furthermore, the Association recommends that n-6 fatty acids should comprise 3 - 10% of the energy intake and n-3 fatty acids should constitute 0.6 - 1.2% of the energy intake. The nutritional value of canola oil arises since it is low in saturated fats, and contains both the n-6 fatty acid, linoleic acid (LA) and n-3 ALA in a 2:1 ratio. In contrast, flaxseed and soybean oils have LA:ALA ratios of 1:4 and 8:1, respectively, whereas sunflower oil has primarily only LA present⁴.

EMERGING OILSEED CROPS AND THEIR APPLICATIONS

Some emerging new oilseed crops have recently been receiving some attention. Borage was traditionally used for culinary purposes, however is now being produced as an oilseed rich in gamma linolenic acid (GLA), an n-6 fatty acid⁵. Borage oil is marketed as a GLA supplement although healthy adults are not typically deficient in this fatty acid. The oil is also used as a therapeutic oil and is formulated into cosmetics. Camelina (*Camelina sativa*) seed oil is suited for cooking and as a nutritional supplement in foods/functional foods. New varieties of camelina are in development for their potential to produce renewable oils for use in lubricants and polymers, providing an environmentally friendly alternative to petroleum products. The camelina plant can survive with little water and fertilizer on marginal land and is attractive to farmers as a rotation crop. Studies conducted by Agriculture and Agri-food Canada (AAFC) on the Prairies show that oil and protein content of camelina accessions ranged from 38 to 43 per cent and 27 to 32 per cent, respectively⁶.



Four emerging oil seeds and their applications

The fatty acids in camelina oil are primarily unsaturated, with only about 12 per cent being saturated. About 54 per cent of the fatty acids are polyunsaturated, primarily LA and ALA, and 34 per cent are monounsaturated⁶. Carinata (*Brassica carinata*) is another oilseed crop well suited for production in semi-arid areas, and can reach oil and protein levels of 44% and 28%, respectively⁷. The crop has an oil profile optimized for the biofuel industry and more specifically for applications in aviation biofuel production. Hemp seed contains 30 – 35% oil and represents a minor oilseed crop grown in Canada in terms of production. The oil contains 50 - 70% LA and 12 - 25% ALA, a ratio in the range of 3:1 of LA and ALA⁸. In addition to its nutritional value, hemp seed oil is of interest for use in cosmetics and therapeutics. Hemp seed is also valued for its protein content, ranging from 20 – 25%, 20 – 30% carbohydrates and 10 – 15% fibre⁸.

ADDING VALUE THROUGH FRACTIONATION AND PROCESSING OF OTHER OILSEED COMPONENTS

In addition to breeding efforts to produce designer oils with better nutritional properties, processing efforts focus on further refining and fractionation of fatty acids for blending purposes for specific applications. Oils can be modified by increasing the concentration of certain fatty acids such as n-3 fatty acids by techniques known as interesterification whereby fatty acids are redistributed on the triglyceride structure of the oil without altering the fatty acids themselves⁹. Other techniques involve selectively fractionating the oil based on its fatty acid composition. Fractionation techniques include fractionation based on the solubility in different solvents such as hexane or acetone (solvent fractionation⁹), melting points (known as dry fractionation⁹), the ability of unsaturated fatty acids to complex with urea and precipitate out of the oil (known as urea fractionation¹⁰) and by distilling off the fatty acids (or fatty acid methyl or ethyl esters) based on their volatility using a technique such as short path vacuum distillation^{11,12}. Fractionation technology

is being used to increase the ALA levels consumed through the incorporation of oil fractions whether as ingredients in our foods or as supplements in our diets.

Extraction of phytosterols (i.e. plant sterols) from the oils is also of significant importance, as they are known to lower the low density lipoprotein and overall cholesterol in the body, and have had scientific evidence showing benefits to lowering the risk of cardiovascular disease¹³. Phytosterols, once collected are either being used as ingredients in food products or for the supplement market in Canada.

The remaining meal left over after oil extraction is now being exploited beyond that of animal feed, for in particular its protein, and secondly its fibre for industrial material applications. The protein extracted from the meal also has market potential in the vegetable protein ingredient industry due to its excellent essential amino acid profile and functionality, provided damage from oilseed processing is minimized. The protein can also be hydrolyzed using chemical or enzymatic methods to produce peptides which may have unique applications such as reducing hypertension¹⁴.

OILSEEDS IN CANADA

Health
Oil content range in levels from 20% in the seeds of soybeans to greater than 40% for some canola and sunflower varieties. Other seed components, such as fibre, and protein by-products offer significant potential for both food, feed and industrial applications.

Production
In 2011-2012 crop year 22.4 million MT
Canola dominating production (14.6 million MT)
Followed by soybeans (4.3 million MT)
flaxseed (0.4 million MT) 1.

Processing
13 crushing and refining/packages plants.
Capacity to crush about 8 million tonnes of canola seed, and in 2011-2012, produced 3.1 million tonnes of oil and 3.9 million tonnes of meal.

Impact
Study shows canola industry's overall contribution to the Canadian economy was valued at greater than \$19 billion.

SUMMARY

Canada remains a global leader in oilseed production and processing of its seed oil. Strong growth in the sector is associated with increasing the value of nutritional oils and value-added fractionation of the oil and meal by-products for its components. In addition, there is increasing value in the development of new oilseed crops for bio-based fuels and industrial bio-products. ■

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Potato Utilization in Canada

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INTRODUCTION

The Canadian potato industry enjoys an enviable position in the global food industry. This is especially true with respect to the value-added processing sector, where a Canadian-based manufacturer, McCain Foods, can boast that one in three French fries consumed globally emanates from a McCain's plant¹. Despite the position of potatoes as an economic powerhouse in the Canadian agricultural and manufacturing sectors, a number of pressures challenge the Canadian potato industry, demanding creative research and innovation solutions. In particular, the strong growth in frozen potato products that fuelled the growth of a sophisticated value-added industry in North America and Europe is now effectively curtailed on these continents². Part of the reason is the perception that the relatively high carbohydrate and fat content of processed potatoes is contributing to the developed world's prevalence of metabolic syndrome. Another challenge, in a manufacturing environment that is increasingly emissions-oriented, is that industries that consume large amounts of water and energy must be pro-active in altering manufacturing practices to reduce their environmental footprint. Nevertheless, innovations in the development of potato varieties and innovations in production and processing practices that target sustainability will ensure that this sector of Canadian agriculture maintains its position as a food industry leader. As will be apparent from this overview, variety development, a key priority within the national research strategy³, is a pivotal element in addressing many of these innovation targets.

FROZEN POTATO PRODUCTS

The massive growth of the quick service restaurant (QSR) industry in the 1960s-80s was founded on a staple of high-quality French fries that could be prepared in a short time^{1,2}.

This in turn drove the growth of the manufacturing industry where frozen potato products were made to exacting food safety and food quality specifications. In attaining this, manufacturers successfully linked a number of different unit operations to ensure the delivery of a high volume of consistently made product⁴. Today, the processing industry utilizes over 60% of the potatoes produced in Canada⁵.

The three predominant French fry quality standards for the needs of the QSR industry are colour, texture and flavour. Few new varieties have met the standards for French fry processing, and so processing in North America is built around a small number of varieties. In addition, tubers need to be long and oblong shaped and have uniform size. In developing new varieties, traits for compatibility for industrial processing are also selected, including high dry matter (solids) and suitability for cold storage. Cold storage at 2 – 4 °C suppresses storage diseases and sprouting to allow for a year-round supply of potatoes for these capital-intensive manufacturing facilities. Unfortunately, potatoes respond to cold temperatures by converting starch to sugars in a process called cold-sweetening⁶. The resulting Maillard reaction of those sugars at the high temperatures of frying leads to undesirable darkened fry colour. Resistance to cold-sweetening is a key trait in the selection of potato varieties for both French fry and chipping markets.

The majority of potato breeding in Canada is carried out by Agriculture and Agri-food Canada (AAFC). Breeding activities are centered at the Potato Research Centre in Fredericton, NB and the breeding farm located at the Benton Ridge Substation. AAFC also breeds for varieties for western growing regions at Lethbridge, AB and the Vauxhall, AB substation. As well as developing varieties for French fry production, AAFC is also

actively developing varieties for chipping and fresh market utilization. Developing varieties with disease resistance is of high interest and recent releases from AAFC have featured resistance to golden nematode, wart, common scab and late blight. A small number of private breeders are also active in Canada, forming the Canadian Private Potato Breeders' Network. These private breeding programs target specific traits or markets including small potatoes, table potatoes, chipping and late blight resistance.

Within the frozen French fry manufacturing plant itself, continual improvements in process efficiency have occurred through improvements in the specific technologies for washing, peeling, slicing, blanching, drying, par-frying, freezing and packaging. Ongoing diversification of product offerings from the industry has led to the introduction of additional unit operations for batter application (to improve fry texture) or flavour enhancement (through electrostatic spray application). As mentioned above, the Maillard reaction impairs product colour, but it is also a food safety concern due to increased levels of acrylamide⁷. Therefore, there has been some modification of both unit operations and ingredients to address this concern. For example, vacuum frying has been investigated as a potential means of reducing acrylamide formation, with the additional advantage that it reduces oil uptake⁸.

One area of continuous innovation that continues to drive process efficiency and improved recovery in the industry is in sophisticated process control tools and manufacturing optimization software. Of note is the elimination of defects, driven primarily by the introduction of high-speed digital imaging technologies⁹. The ability to capture and process data at nanosecond timescales ensures that the deployment of near-infrared¹⁰ and hyperspectral imaging technologies¹¹ will continue to drive process innovation.

Attaining a consistent optimal texture in frozen French fries for QSR requires removal of a large amount of water during manufacture. The energy costs associated solely with the latent heat of evaporation are considerable, and to this must be added the in-plant energy costs of heating water and oil and doing work to remove heat during the freezing operation. As a result, the potato processing industry is committed to strategies to harvest heat at various points during manufacturing and to

capture waste solids so that they can be used for sustainable energy purposes such as biogas engines.

Water is a vital process aid for multiple operations during manufacturing. To reduce aqueous emissions from manufacturing plants and to reduce overall water consumption, various approaches have been employed. Examples include reusing the effluent of one operation in another operation whose water quality requirements are less critical, and devising creative separation technologies for removal of solids from water streams. For instance, using such approaches, Lamb Weston has formulated a 2020 objective of reducing their water usage per unit mass of finished product by 50%¹². In achieving this, additional co-product streams (such as high quality ungelatinized starch) can be developed and these will also improve overall plant efficiency.

CHIPPING INDUSTRY

Although Atlantic and Prairie provinces predominate in the production of frozen potato products, Ontario is an important producer of potato chip (crisp) offerings. Chipping potato varieties need to produce round tubers with high dry matter that will fry to a light chip colour to meet standards for industrial processing. Chip potato breeding therefore involves selection of lines with low-reducing sugars and cold-sweetening resistance. There is also a research focus on storage practices that minimize the development of reducing sugars¹³. Novelty chips with pigmentation have also hit the market, including chips with red and purple colouring. The coloring is from naturally produced anthocyanin pigments that are also found in berries. Potatoes have genetic variation in colour, intensity and patterns of pigmentation. Recent products include chips with star patterns due to pigment deposition in vascular tissues of the potato tuber.

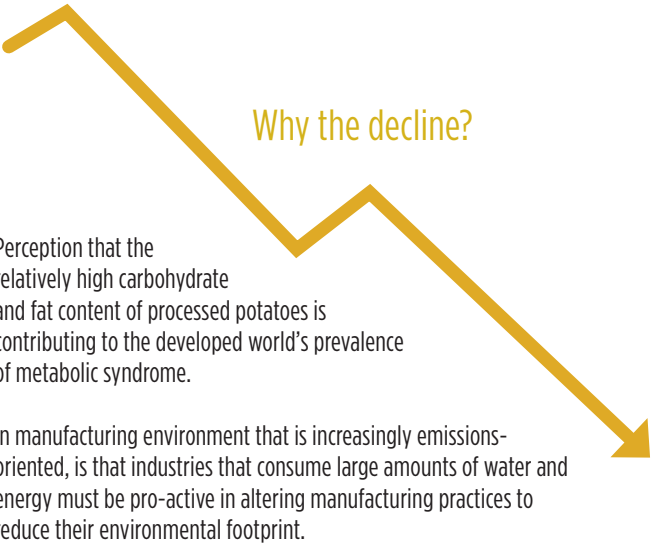
FRESH MINIMALLY-PROCESSED POTATO PRODUCTS

Although health concerns may be slowing the consumption of chips and French fries, consumer convenience in food offerings is not a trend that is abating. Therefore, there has been significant growth in fresh ready to heat potato products. Some examples are cut frozen flavoured products and non-frozen items such as steam-in-the-package and refrigerated

flavoured mashed potato products. Increased culinary interest in the potato is also driving growth in this sector. Often, market interest is variety specific due to specific flavour or appearance demands, and this is reflected in the outcomes of potato breeding programs. For example, in 2013, nine of the 14 selections released from AAFC were for the fresh market. Traits screened for the fresh market include boil and bake texture and flavour and flesh colour (ranging from white to yellow). Tuber appearance is important for the fresh market and breeders have to select for low tuber defects and uniform tuber size. Because of the importance of appearance, variety releases for the fresh market have included selections with red and purple skin and skin with splashes of pink around the eyes. Selections with small tuber size (also referred to as creamers) are also of interest for the fresh market. The fresh market for potatoes is now at 25% of the industry⁵. The growth of this sector has also driven research to tackle safety and quality concerns associated with these minimally-processed products¹⁴. There have also been innovations made in packaging technologies, particularly for those products that rely on modified atmospheres for shelf-life extension.

SEED POTATOES

Tubers are the consumed part of the potato plant, but they are also used to clonally propagate the crop. These seed tubers can potentially carry diseases from the previous season. As such, the health and quality of the potato seed supply in Canada is monitored and regulated by a seed certification program to



protect the industry. The Canadian Food Inspection Agency (CFIA) is responsible for the administration of the Seeds Act and Regulations and carries out inspections for the certification of seed quality. Potato seed growers are required to meet higher standards of production to maintain low levels of quarantined pests. Of particular concern to the Canadian seed growers in recent years are Potato Virus Y (PVY), potato wart, golden nematode and cyst nematode. Seed potato is sold at higher prices, which compensates for the costs of maintaining high standards for production on seed farms. In 2010, 15% of the potatoes produced in Canada were for the seed market with the exported seed potato having a value of \$36 M from 18 countries⁵.

MAXIMIZING VALUE FROM CANADIAN POTATOES

Although the direct production of food products from potatoes dominates the Canadian potato sector, the continual need to add value to Canadian agricultural resources has driven the development of alternative uses for potatoes. Given the high starch content of potatoes, there has been interest in the development of alternative food and non-food products from potato starch. Potatoes have two types of starch polymers: amylose and amylopectin. Altering the amount of each polymer in different potato varieties leads to different physiochemical properties of the starch¹⁵. Genetic modification has been used to produce a pure amylopectin potato, Amflora¹⁶ and a potato enriched in amylose¹⁷ that are specifically targeted for industrial use. Industrial applications for potato starch produced from these and other varieties have included thickeners, bioplastics, pharmaceutical fillers, binders, disintegrants and gelling agents¹⁸. Industrial starch production from raw potato occurs predominantly in Europe and China. In Canada, starch is produced mainly from recovered cuttings and filtrate from French fry and chip processors. The BioPotato Network has been active in adding more value to this important potato resource. This Canadian-based network, funded by the AAFC Agricultural Bioproducts Innovation Program from 2008-2011¹⁹, developed starch modification processes for industrial applications ranging from resistant starches for the food and feed industries to bioplastics and pharmaceutical excipients. The BioPotato Network has also investigated the development of health bioactives and biopesticides from potatoes.

COLOURED FLESH POTATOES

Anthocyanins, naturally-occurring pigments responsible for pink, red and purple pigmentation in plants, have been shown to prevent some human diseases²⁰. Health benefits of anthocyanins are attributed to their anti-oxidant activities.

Potato anthocyanins in particular have been associated with reducing growth of cancer cells²¹. The anti-oxidant capacity of pigmented flesh potatoes was as high as 35% of berries. The health benefits associated with anthocyanins have increased interest in breeding potato varieties with intensely red and purple pigmented flesh²². Pigmented flesh selections recently released by AAFC have targeted the French fry and table markets. Additional utilization of pigmented flesh potatoes include processing into dried granules and flakes that retain high levels of anthocyanins after processing²³. Addition of dried pigmented potato granules and flakes to processed food products provides a way to enrich foods with beneficial anthocyanins.

LOW GI POTATOES

Glycemic index (GI) is used to measure the rise in glucose level after consuming the food²⁴. Health concerns for obesity, cardiovascular diseases and diabetes have increased demand for low glycemic index foods. Potatoes, like other carbohydrate-rich foods, tend to have high GI. Variation in GI has been found for different potato varieties and for different cooking methods^{25,26}. Genotype by environment variation in the digestibility of potato starch has also been described²⁷. The GI of potatoes can be reduced through breeding for potatoes with less digestible starch content so that niche varieties for low GI diets can be developed. AAFC has recently released one low GI selection.

CONCLUSIONS

Although Canada's potato production and processing industries face some challenges, potatoes remain a strong component of Canada's agriculture and value added manufacturing industries. Innovations that will ensure the sustainability of a valuable value-added potato sector are key to the industry's future prosperity. These innovations will be required in plant breeding, agronomy, and in storage and manufacturing facilities. Marketing strategies that emphasize the nutritional quality, as well as the convenience of processed potato products, are also needed to ensure vitality for the industry. Because potatoes are a rich source of nutrients and carbohydrate polymers, the prospects for diversification of products in the potato industry are good. ■

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A small company ‘Survivor’ doesn’t have to exist as an island

RON KEHRIG

STARTING AND OPERATING A SMALL COMPANY IS NOT EASY, and it is hard to survive. It often seems like far too many skill sets need to be found among very few bodies within the company. At times it may feel like you are alone – on “Company X” island.

Fortunately, outside resources are available, but like most things, there is usually a cost. Sometimes that ‘outside resource’ is recognized as needed in solving issues relating to time, operational capacity or expertise. Unfortunately, management’s challenge often is in paying for what is needed. As a result, a lot of direct management time and energy is spent learning and accessing the latest funding program.

Research and funding programs are important to the development and survival of many small to medium companies, and many institutions and university researchers also rely on these support mechanisms along with interaction with small companies (and large) to bring a commercial relevance to their programs or gain access to competitive research dollars. There is a

definite synergy with the right partners, and a little bit of money may go farther than you think.

In many ways you are not alone, and these resource suppliers could be convinced to be willing allies to get additional resources working for you with the right project. These experts are often quite adept in leveraging funding for research and may even help draft proposals or assist in project design and completion. In short, they may have the added capacity or expertise you need. Researchers may also be able to access funds not accessible to you directly through the Natural Sciences and Engineering Research Council of Canada (NSERC, www.nserc-crsng.gc.ca) or other programs you may not even be aware of.

Getting to know the hard and soft infrastructure in your area (both your geographic area and that relating to your product areas) can pay dividends. Public infrastructure as well as private (or quasi-private/cost recovery) resources may exist that you were not fully aware of. There may be someone

with expertise, specialized or available equipment or something else you uncover once you start looking. It is sometimes hard to list all the capabilities and options on a website, and that rarely replaces having a discussion directly with someone in the organization.

Research and funding programs are important to the development and survival of many small to medium companies, and many institutions and university researchers also rely on these support mechanisms along with interaction with small companies (and large) to bring a commercial relevance to their programs or gain access to competitive research dollars.

Don’t be afraid to pick-up the phone or arrange a meeting with a researcher to discuss your technical challenges. It is a good idea to spend some time in discussions with the subject matter experts and ask them about the things you need like toll-processing, pilot-plant facilities or packaging facilities available in your area. It is seldom too early or too late to begin this process. You may be at the stage of assessing a new opportunity or need to solve a processing or packaging problem or simply have a question like ‘What can I do with my byproducts?’ Most researchers are very open to meaningful

MOST RESEARCH GROUPS KNOW THE IMPORTANCE AND BENEFITS OF WORKING WITH INDUSTRY PARTNERS IN THEIR WORK AND THE IMPORTANCE TO FUNDERS.



discussions on your technical issues, but be mindful of their time and your own, and stay focused.

In Saskatchewan for instance, many small companies have benefited from collaborations with all kinds of expertise and facilities in the area from analytical or processing work to basic research. The Saskatchewan Food Centre (www.foodcentre.sk.ca) is an active partner in product development and early stage processing for many food categories from snacks, soups and sauces to extruded products and drinks. Similar types of centres exist across Canada, specializing in food and bio-product processing and commercialization to cater to the needs of small, medium and large enterprises. Other facilities, such as POS BioSciences Corp. (www.pos.ca, Saskatoon, SK) also can do ‘toll-processing’ for larger scale processing and extraction, and for clients processing market volumes prior to constructing a dedicated facility. Organizations like these can also often be tapped into for technical guidance and support.

Most research groups know the importance and benefits of working with industry partners in their work and the importance to funders. Academic institutions often have several Research Chairs funded by provincial-federal governments or industry, faculty or extension personnel who are strongly encouraged to work with industry and

are always open for collaboration – it may not cost as much as you think. Leveraged funds may even be available to the research team working on your issues for in-kind participation or materials, etc.

Universities and research organizations also usually have a business liaison or technology office, which – in addition to managing intellectual property or research agreements – can help you sort out which researcher would be most appropriate to meet with. Even if you don’t end up owning intellectual property coming out of the research, early involvement in the research may give you an option for a license to it or first-right of refusal to commercialize it.

Some provinces have specialists to guide you or industry associations with technical help or path-finding services. While public infrastructure and universities are a good place to start, don’t assume private facilities or persons are off limits either – sometimes it may be that your contact is just what another company or person has been

looking for, but just didn’t know you existed or would collaborate.

The investment in time to contact others and get them working with you to leverage available funding may be a better use of time than holding up in a room writing your own direct proposals for funding.

Entrepreneurs sometimes fear that by asking for help, they will be seen as a corporate or personal deficiency by funds or financial organizations. Quite the opposite is true. Recognizing your company’s capacity and managing relationships to get the job done with and through the capabilities of others is more often seen as talent or strength, and that’s one reason many comment that they “invest in people and not the specific business.”

It can be a complex and a daunting task to sort out where to start, but sometimes the best thing to do is dive into building your network and contacts rather than being an island.

Who knows – if you are really successful, maybe you can live on or buy an island when you retire! ■

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ONTARIO'S GROWING FOOD CLUSTER

TEXT BY LINDSAY GRUMMETT

FOOD IS A VITAL PART OF THE CANADIAN ECONOMY. So much, in fact, that in 2007 more than 70 per cent of the food purchased in Canadian stores was produced domestically. Beyond Canadian borders, the global food market was valued at \$4.2 trillion (USD) last year. The global marketplace offers promising opportunity for companies with innovative products and ideas, but breaking into the food industry can be next to impossible without support.

Location-based food clusters are geographic concentrations of interconnected companies and institutions that can become a source of competitive advantage. Michael Porter, a professor at Harvard Business School and an authority on the subject of clusters, describes the key elements as educational institutions, transportation infrastructure, investors, suppliers as well as logistical and human resources.

Traditional food clusters are based around a particular commodity, but as the importance of food innovation grows so does the need for a collaborative environment inclusive to the wider food industry. For this reason, location-based clusters are sprouting up across the globe as regions, provinces, states and countries band together to enhance their role in the domestic and international food markets.

INTERNATIONAL MODEL OF EXCELLENCE

"Food Valley is probably the best recognized food cluster in the world for its innovation practices. They have established a system in which there is very strong collaboration between industry, government and the academic institutions," says Luis Garcia, the chair of the Institute of Food

Processing Technology (IFPT) at Conestoga College.

Food Valley is a location-based food cluster in the Netherlands that supports and encourages food innovation. The organization's aim is to stimulate the innovative power of the Dutch agri-food cluster through a demand-driven combination of enterprise and knowledge.

The organization is helpful to the Dutch agri-food sector in many ways like connecting business to knowledge-based resources such as universities and research institutes and also promoting knowledge development of its members by offering seminars like "Legal aspects of collaboration" and "Aging people and food."

"They have figured out how to make it easy for the three sectors to collaborate and develop new products and technologies," says Garcia. "It's an ideal environment especially for small companies to start up their business with new products."

Garcia says Food Valley is on the forefront of disruptive innovation for the food industry.

"They come up with ideas that are not just outside the box, they disrupt the system," he explains.

Ontario organizations are working to replicate aspects of this location-based food cluster in order to create a more collaborative and results-driven industry.

LOCATION-BASED CLUSTERS

The Ontario Food Cluster is a members-based organization that seeks to attract foreign investment and business opportunities into Ontario's food processing sector.

"The group is made up of 10 municipalities

WITH THE HELP OF
STRONG EUROPEAN
EXAMPLES,
LOCATION-BASED
CLUSTERS ARE
BRINGING
COLLABORATION AND
INNOVATION TO THE
FOOD INDUSTRY

BUSINESSES

GOVERNMENTS

UNIVERSITIES

ONTARIO'S FOOD AND
BEVERAGE SECTOR IS
EXPECTED TO GROW TO A

\$40
BILLION

INDUSTRY BY THE
END OF 2013



TOP: Visitors to the Anuga food fair in Germany tasted innovative food ideas from around the globe.

ABOVE: Scandic Food, the largest manufacturer of jams and marmalades in the northern part of Europe, was one of over 6,500 suppliers exhibiting at the Anuga food fair.

RIGHT: The Anuga food fair's Matchmaking365 program connects companies to further discussions on potential collaborations and investment opportunities.

that have a strong representation from the food sector in their economy," says Brad Hammond, a development officer for the City of Woodstock and the current chair the Ontario Food Cluster.

Developed only three years ago, the Ontario Food Cluster is a relatively new organization. Although its current focus is on investment and business growth, it also offers opportunities for businesses to connect with the government and researchers since the University of Guelph and the Ministry of Agriculture Food and Rural Affairs are also members of the group.

"Food Valley is a much more mature version of what we have here in Ontario," says Hammond. "We have a lot of the same components; we just haven't linked them all together yet. We're quite focused on the FDI (foreign direct investment) side of things and we're not sure where we fit into linking universities to companies."

In October, Hammond and associates from the Ontario Food Cluster travelled to Germany for Anuga, a leading world food fair. Hammond said they met with approximately 70 companies and discussed opportunities for investment in Ontario. "We've got to convince them the advantages of being in Ontario rather than another jurisdiction," says Hammond.



THE ONTARIO ADVANTAGE

Ontario's food and beverage sector is comprised of more than 3,000 food and beverage companies and is expected to grow to a \$40 billion industry by the end of 2013. The agriculture, agri-food and beverage sector is also the province's number one employer.

The food industry adds significant value to the provincial economy with more than 130,000 people working directly in agri-food processing, manufacturing or wholesaling and almost half a million working in related sectors like food service and retail. In addition to a strong workforce, Ontario also has one of the lowest corporate tax rate in North America adding

additional incentives for businesses to locate in the province.

Location-based clusters allow for easy information sharing and promise a steady flow of communication throughout the network. This structure works well for businesses and food innovation companies looking to expand the use, production and impact of foods.

"Of course, we now live in a more virtual world and communication is so easy, but having the resources at hand does make a difference," says Luis Garcia of the IFPT. "It encourages the creation of new companies and new research institutes."

This type of location-based co-operation within the food sector can lead to strengthened food research, reduced business costs as well as increase productivity allowing businesses to compete on a local, national and global scale.

CITY OF GUELPH

Within the province are even more localized clusters and the University of Guelph is playing a key role in its city and around the province. Guelph has distinguished itself as a pocket of agricultural activity in Ontario by supporting sustainable innovation sectors like agri-food and bio-sciences. This internationally recognized cluster includes 43 research centres and programs, 38 food and agri-business associations and has attracted more than \$350 million in private investment since 2003.

"This really is the centre for agriculture in Ontario and more and more for the country," explains John Melichercik Director of University of Guelph's Agriculture and Food Laboratory. "Federal government and provincial government agencies that look after food and agriculture as well as many private sector organizations have located themselves in Guelph – largely because food and agriculture is one of the strengths of the University of Guelph."

The University of Guelph's success in the agricultural realm can be attributed in part to its 125-year relationship with the Ontario government. In that time the two establishments have worked together to support Ontario's agriculture and food sector as well as safe food practices.

The University of Guelph also has close ties to Wageningen University and Research Center, a school that has a leading role in Food Valley's agri-food research and innovation. This food-based connection between the schools has helped

form additional industry relationships between Food Valley and members of the Ontario Food Cluster.

Hammond visited Food Valley after his trip to the Anuga food fair and spent two days with companies, the university and the regional

In Ontario, almost half a million people work in food-related sectors like service and retail.

marketing groups to learn more about the collaborative environment that makes them so successful. "In this small part of Ontario, we have all the key players that are needed to develop a similar system. We need to learn from Food Valley and how they created this movement toward collaboration."

LEARNING CURVE

Ontario's food cluster is still relatively new by international standards, but it is becoming stronger as more institutional supports like Conestoga's IFPT are added. This facility opened in 2011 and was developed as part of an initiative by the Alliance of Ontario Food Processors who saw a need for more knowledge development in careers like food processing, machine operating and machine maintenance. The institute has diploma and apprentice programs as well as courses for supervisors currently in the field. It also has a state-of-the-art food processing facility with three production lines that cost approximately \$5 million and is used specifically for training purposes.

"One of the challenges [in Ontario] is how academic institutions and industry interact. There needs to be not only stronger ties between both sectors that are based on trust and collaboration," says Garcia, "but also, industry needs a more agile, quicker response which they don't always find at universities."

In Food Valley, fundamental agri-food research is performed at the university and separate knowledge institutes respond to the needs of industry. Garcia believes the IFPT could play a central role in the latter category as long as industry collaboration continues to grow.

Food Valley also aids food innovation with its Innovation Link that is used to connect small- and medium-sized businesses with researchers or expertise. This has had a profound impact on

some of its partners like FZ Organic Food. The company was looking to reduce the amount of rejected potato chips during processing and connected with TOP Consultancy through Innovation Link. The group offered key advice that led to significant improvements to the company's production process.

"When you're investing in quality, food safety and innovation, independent advice is extremely valuable," says Björn Andringa, Managing Director at FZ Organic Food. "It also enables you to look at your own production and process through a more critical lens."

The food cluster has also developed some simple ways to foster collaboration between industry and academic.

For example, the Impulse building at Wageningen University and Research Center has a restaurant and meeting rooms for researchers and industry to meet. "They provide a venue for the meetings to happen and encourage face-to-face interaction that will end in stronger collaboration," says Garcia.

The university also allows companies and knowledge institutes to access its CAT-AgroFood research facilities which include state-of-the-art laboratories and the latest technology. Businesses can reduce spending by using these shared facilities that are essentially pay-per-use and include no fixed operating costs.

Food Valley's simple yet strategic activities make collaboration a cornerstone of the food industry in the Netherlands. The location-based cluster shows how partnership can produce results and create a stronger and more profitable business environment.

COLLABORATIVE MOMENTUM

A 2013 report released by Agriculture and Agri-Foods Canada says that the competitiveness of the food sector depends on its ability to remain profitable and viable over the long term with regards to its competitors in relevant markets.

The Food Valley model shows the benefits of collaboration and how it can lead to success and advancement for its individual members. Location-based clusters create the best environment for collaboration and innovation, but it's up to the individual groups to take action.

"We need to change our mindsets. We need good leadership and for the major players to come to the table and work together" says Garcia. "You don't need to start with 3,000 processors. You can get started with five or 10." ■

THE GLOBAL FOOD MARKET
WAS VALUED AT

\$4.2
TRILLION
USD
IN 2012

MORE THAN 130,000
PEOPLE WORK IN AGRI-
FOOD PROCESSING,
MANUFACTURING OR
WHOLESALE IN ONTARIO



NATHALIE LAMBERT

TEXT BY NICOLAS HEFFERNAN

FOOD NUTRITION HAS COME A LONG WAY SINCE NATHALIE LAMBERT WAS WINNING OLYMPIC MEDALS FOR CANADA.

The Montreal native won speed skating gold in the Albertville games and two silvers in Lillehammer but her career was nearly derailed by a vitamin deficiency. “For two years when I was skating I was iron-deficient and I had anemia and it was a very tough time in my life. I really want to make sure nothing like that is happening to [my kids],” she says.

As a mother and fitness expert working with the Club Sportif de MAA, formerly the Montreal Athletics Association, she is preaching the importance of a healthy lifestyle and using her profile as a successful athlete to help people make good choices by endorsing products like Saputo’s new Milk2Go, a ready-to-drink protein shake with made with fresh milk.

HOW DO YOU CHOOSE WHAT PRODUCTS YOU ENDORSE?

[It’s] based on do I believe in the product, do I think it’s actually good for people, would I recommend that for my kids. If the answer to all of that is yes, then ok. If it’s not yes to all three, then no.

HOW HAS BECOMING A MOTHER CHANGED THE WAY YOU VIEW NUTRITION?

I pay way more attention to what I put in the lunchbox of my kids than I would for myself. For me it’s really important that they eat a balanced diet and they have on a daily basis all the nutrients, protein and vitamins they need.

HOW HAS SPORTS NUTRITION CHANGED SINCE YOU WERE COMPETING?

I think the science of sport period has changed since I was competing. We now know how to build specific qualities, how to recover from training. There’s not just the head coach anymore, there’s all the scientists that are helping and they’re fine tuning preparation and the major place they’re working on is really the recovery between one workout and the next.

WHAT IS YOUR FAVOURITE FOOD TO COOK WITH?

I use a lot of olive oil. I come from a family where we would do everything with butter and I’m not saying butter is not good – butter is part of a balanced life – but I’ve shifted more to using olive oil and those special oils.

FOOD-WISE, WHAT IS YOUR GUILTY PLEASURE?

I have a lot of them. I love popcorn. Popcorn and wine are my guilty pleasure. To me it rhymes with relaxation.

WHEN YOU WERE COMPETING, HOW WAS THE FOOD IN THE ATHLETE’S VILLAGE?

Very good. It’s much better now but it was already very good. I’ve been in Vancouver as the chef de mission and I have to say the cafeteria, ‘Oh, my god. Unbelievable.’ ■

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