

# From Lab to Table

RESEARCH AND RECIPES, 2014-2022







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# Introduction

## Acknowledgments

Red River College Polytechnic is committed to ensuring that First Nations, Métis and Inuit knowledge, cultures and traditions are embraced and reflected in the pursuit of its mission, and to a renewed relationship and dialogue with First Nations, Métis and Inuit peoples based on mutual trust, respect, and reciprocity.

An acknowledgement of these lands that we are on today, and of the RRC Polytech commitment to Indigenous peoples and communities, now forms part of the foundational statements that define the College.

RRC Polytech campuses are located on the original lands of Anishinaabe, Ininiwak, Anishininwak, Dakota, and Dene peoples, and on the homeland of the Red River Métis Nation. The water we use is sourced from Shoal Lake 40 First Nation. Our electricity comes from Manitoba Hydro, which has a presence on Treaty 1, Treaty 2, Treaty 3, Treaty 4, and Treaty 5 lands.

Prairie Research Kitchen commits to honouring and supporting Indigenous communities while we build relationships through the celebration of food with ingredients from these lands, and while drawing upon energy and resources from territories across Western Canada. We respect the Treaties that were made on these territories, and we commit to work in partnership with Indigenous communities in a spirit of reconciliation and collaboration.



Prairie Research Kitchen acknowledges our funders and supporters for their generosity over the past eight years. Without these grants, the development of this vibrant culinary research program would not have been possible. To date, we have helped hundreds of food-based companies across Western Canada achieve their innovation goals and have introduced hundreds of students to career possibilities in applied research, food product development, and entrepreneurship.

We gratefully acknowledge the following funding:

- **Prairies Economic Development Canada** (PrairiesCan, formerly Western Economic Diversification Canada) - \$2 million (2013)
- **Natural Sciences and Engineering Research Council** (NSERC) Innovation Enhancement (IE) - \$2.3 million over 5 years (2016)
- **Canadian Foundation for Innovation** - \$1.3 million for infrastructure and operations (2018)
- **Research Manitoba** - \$1 million (2018)
- **NSERC Technology Access Centre** (TAC) - \$1.75 million over 5 years (2019)

A special thank-you to NSERC for additional support that helped us operate throughout COVID-19, and kept students employed who might not otherwise have found work experience opportunities they needed to complete their academic programs.

Companies we've worked with have also been supported by several provincial and federal funding initiatives related to innovation and growth to offset the risks associated with research. Support from programs such as the National Research Council - Industrial Research Assistance Program (NRC IRAP), NSERC Engage and Applied Research and Development (ARD), Canadian Agricultural Partnership (CAP), and Protein Industry Canada (PIC) help these companies work with organizations such as Prairie Research Kitchen to further their growth through research.

We also wish to thank RRC Polytech for supporting our research as part of its strategic priorities and commitments through access to infrastructure, staff, and financial contributions over the past eight years.



Supported by:



Prairies Economic Development Canada

Développement économique Canada pour les Prairies





# A History of Culinary Research at RRC Polytech

A RETROSPECTIVE BY FOUNDING DIRECTOR MAVIS MCRAE

The idea for a culinary research program at RRC Polytech started with a 45-page plan commissioned by Ray Hoemsen, Executive Director, Research Partnerships & Innovation (RPI) in 2012 and researched and written by Susan St. George. The document contained a thorough overview of food research programs across Canada and a specific review of the needs in Manitoba. Programs existed in Eastern Canada at Holland College, Niagara College and George Brown College. These were all NSERC-funded Technology Access Centres (TACs) housed within culinary schools for the purpose of working with industry on product development. The model existed – just not in Western Canada. The recipe provided by our research plan listed all the ingredients we needed to cook up a uniquely made-in-Manitoba solution for culinary research and innovation.

When we began to implement the plan, we had a blank canvas. Although we had no assigned chefs or staff, no programs, and only one project, what we *did* have was access to RRC Polytech's new School of Hospitality and Culinary Arts at the recently renovated Paterson GlobalFoods Institute in downtown Winnipeg, along with the talented and creative instructor pool. We also had a long and successful history of research at the College with two existing Technology Access Centres, and active research programming led by a small but mighty Research Partnerships & Innovation team. And there was me, a consultant with a background in food science and entrepreneurship with twenty-odd years of food industry contacts to lean on, and excited to build something new for the food entrepreneurship and manufacturing community. Together, we set into the unknown the way any true researcher would: by formulating a hypothesis for what might work, devising a research plan, experimenting, and building on the results.

Eight years and over eight million dollars in investments later, Prairie Research Kitchen has proven that a successful culinary-based food research program in Manitoba is possible. More than that, it's proven to be a colossal hit with our community.

This book outlines the recipe for success that went into building this research program, from all the federal and provincial funding that fueled our programming, infrastructure, and collaborations, to all the hard work, expertise and resources from RRC Polytech, our research partners, and our staff.

Reviewing our history allows us to highlight our innovations, celebrate our successes, and look ahead to the future of food research. But the best part of culinary research is, of course, all the great food we helped create. Food is meant to be shared, and this book is an opportunity to showcase food products and ingredients we are proud to have played a part in developing or demonstrating their benefits over the past eight years.

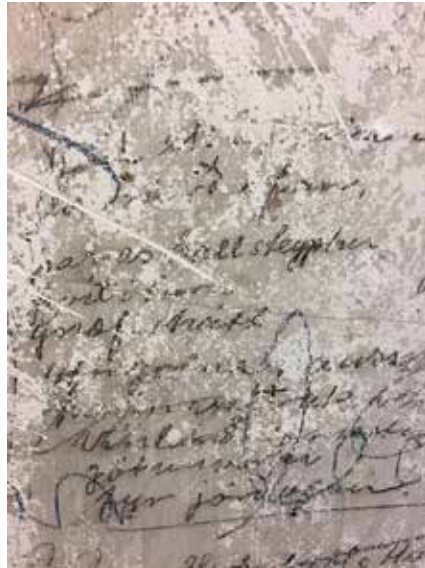
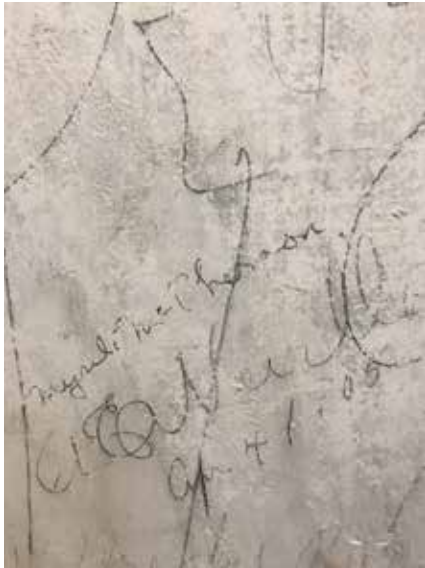
## Moving RRC Polytech's Hospitality and Culinary Programs Downtown (2011-2014)

Paterson GlobalFoods Institute lives in what is historically known as the Union Bank/Royal Bank Building, western Canada's oldest skyscraper. An example of the Chicago architecture school, the building was constructed in 1903-1904 using steel framing, which was new technology at the time.

When RRC Polytechnic undertook its reconstruction in 2009, the building had been abandoned for almost 20 years. The two-story attic which begins on the 11th floor and now houses PRK is adorned with a decorative terra cotta frieze and porthole windows beneath an overhanging cornice designed by original architects Darling and Pearson. During construction of the research kitchen, the building's steel I-beams were left exposed as part of a new skylight opening, flooding the space with natural light and transforming the venerable building's bones into a design feature that celebrates its past and present.

The building reopened in 2013. The total construction cost of \$27 million was supported by the Government of Canada, Province of Manitoba, City of Winnipeg/Centreventure, and Paterson GlobalFoods/The Paterson Foundation.





**FUN FACT** If you walk up PRK's back stairs towards the roof, you'll find graffiti from 1905 (among more recent samples) on a wall that was preserved as a part of the building's heritage status.

This part of our history starts with Ray Hoemsen. It was his vision to bring a concept developed in Eastern Canada to the Prairies.

"The idea for a culinary-related applied research program first emerged over a decade ago. Applied Research at the College was off to a good start and laid the foundation for a new initiative to further support economic development in the community. The restoration of the Royal Bank/Union Bank Tower as the Paterson GlobalFoods Institute, coupled with the College's culinary-related academic programs, were the key ingredients to developing an applied research program bringing together the culinary arts with food science and technology.

"When we came up with the plan to bring culinary research to Manitoba, there were around 13,000 Manitobans working in food manufacturing, and the industry was contributing over \$4 billion in sales. Since then, those numbers have only grown, and agri-processing now accounts for \$6.3 billion in sales - a clear indication of this industry's importance to our province's economic growth. What drove our success was our commitment to making new food products that aren't just healthy or innovative - they taste great to consumers, too."

The initial investment that kicked off our program came from a \$2 million grant from Western Economic Diversification (now PrairiesCan) "toward the acquisition of modern food service equipment and installations to enable the development of an applied research program in food technology related to the culinary arts."

Our applied research program began with five priorities:

1. New product and process development
2. Technology transfer to industry and organizations
3. Commercialization of new and re-branded products
4. Raising awareness of Manitoba's food and beverage industry
5. Enriching the experience and capabilities of tomorrow's culinary research graduates

Paterson GlobalFoods Institute (PGI) officially opened February 2013. The facility provided a new space and state-of-the-art facilities for students enrolled in programs in RRC Polytech's School of Hospitality and Culinary Arts. It also featured a Culinary Exchange café and Jane's Restaurant, where students could put their skills to work serving the public.

The WED grant tasked PGI with delivering 30 technology demonstrations, identifying 30 products and/or processes for research and development, and forming at least 40 partnerships with industry associations/organizations and companies by March 31, 2014.

Those deliverables formed the basis of my initial goals. My first task was to secure a chef instructor to work with, since my own kitchen training amounted to a couple summer front-of-house gigs plus an illustrious high school cooking career at McDonald's.

Chef instructors Don Pattie, Gordon Bailey, Brad Gray and Sean Audet all pitched in to help achieve (and exceed) our goals, and set the program on a path towards the next step in the process: securing a longer-term grant that would allow us to hire full-time staff and students.



## Building Capacity - NSERC-IE (2016-2022)

Following our whirlwind kickoff, it was time to expand the program. The \$2.3 million NSERC Innovation Enhancement grant (NSERC-IE) was an excellent option for growing the College's innovation capacity across Western Canada.

According to NSERC:

*"The objective of the IE grants is to increase innovation at the community and/or regional level by enabling Canadian colleges to increase their capacity to work with local companies, particularly small and medium-sized enterprises (SMEs). The grants support*

*the growth of applied research capacity, leading to increased business collaborations that facilitate commercialization, as well as technology transfer, adaptation and adoption of new technologies."*

The program would support everything from hiring research staff, buying equipment and supporting operations to instructor engagement and student employment. With \$500,000 for the first three years and \$400,000 annually in years four and five, NSERC-IE would provide ample funds to achieve our objectives.

The nice part about being a part of a vibrant and successful research team at the College is the access to a wealth of past knowledge and experience, including previous examples of large funding proposals I could draw inspiration from. Past proposals and the infrastructure built to support the application processes laid out a path I could follow with confidence. This is the value of having a dedicated research office with experienced managers.

Armed with a structure for federal applications plus years of business and strategic plan development experience, I got to work on our 2015 submission for this highly sought-after program. We were immediately successful and received our NSERC-IE funding for capacity building in 2016. We hired our first full-time research manager, Joel Lamoureux, followed closely by our first research technician, Kyle Andreasen. Thanks to this funding, we achieved some early successes, including the Miso Project (page 34), a large industry project with Richardson International, and many projects for small to medium enterprises, which led us to be awarded an RRC Polytech BRAVO Award for Research Excellence in 2018.

## BRAVO Award

The RRC Polytech BRAVO Award for Research Excellence recognizes individuals and/or teams who have:

- Made an outstanding contribution in support of applied research; and/or
- Contributed to establishing an environment which welcomes research and/or supported others in their research endeavors; and/or
- Made an outstanding contribution to a course, project, program and/or community partner.

This award celebrates the behaviours, actions and attitudes demonstrated by employees over the past calendar year.



## Moving into a New Home

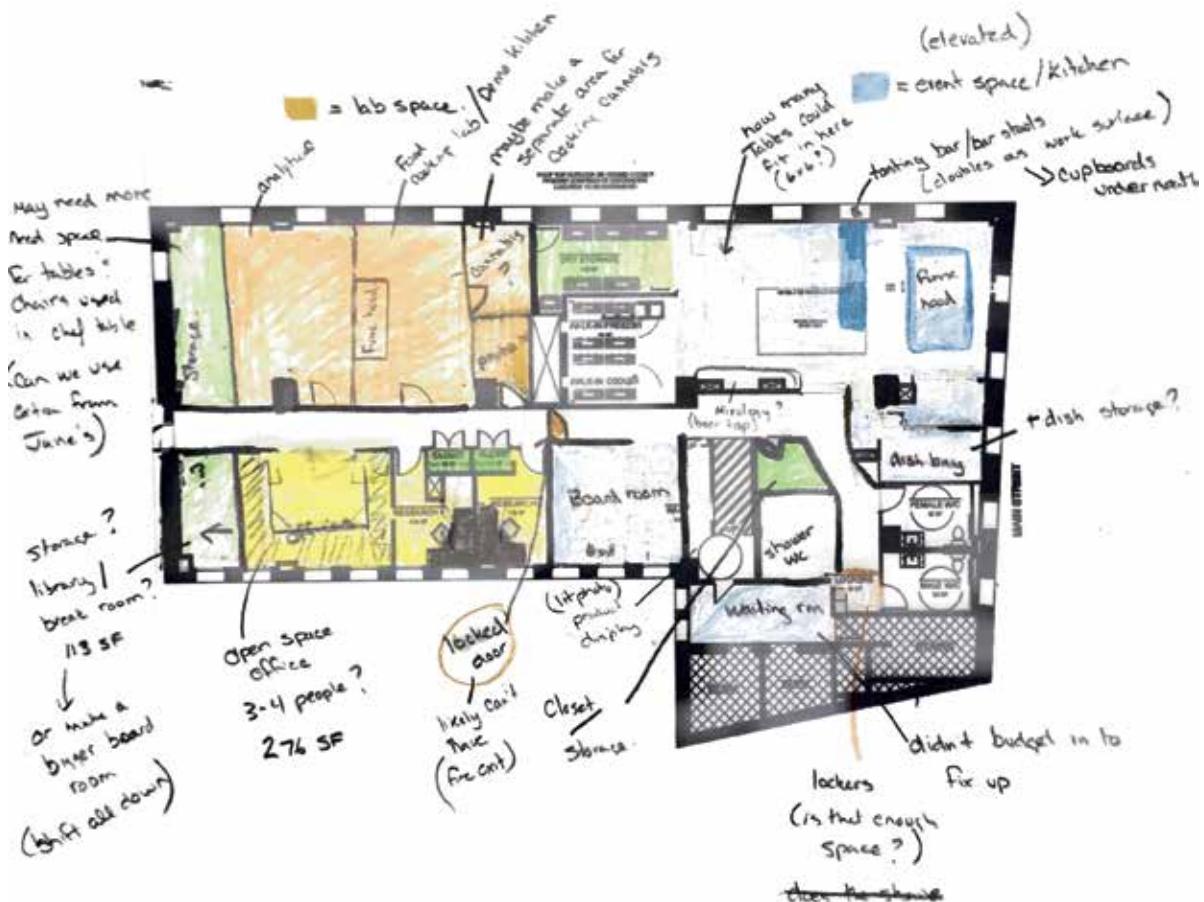
Due to the pace and number of projects coming our way, it soon became apparent that the growth of a robust culinary research program was incompatible with sharing space with academic programming. Our team had now grown with the addition of Heather Hill, Research Manager and Anna Borys, Research Assistant.

It was time to build a home for ourselves. A few options were considered, including the former culinary kitchens at RRC Polytech's Notre Dame campus, and space in Manitou a bi Bii daziigae, but we wanted to stay close to the culinary, baking and hospitality students. Fortunately, when the new School of Hospitality and Culinary Arts was built at 504 Main Street along with the student residence,

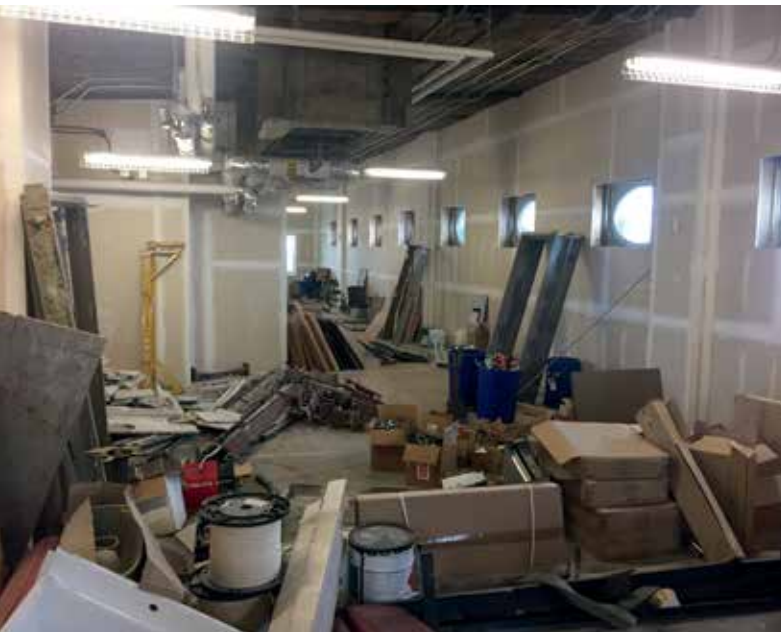
the 11th floor was left open and undeveloped - almost as if they were waiting for just the right occupants to come along.

Renovations in a historic building can be challenging, but thanks to a one million dollar grant from the Canadian Foundation for Innovation, a one million dollar grant from Research Manitoba, and \$745,000 from RRC Polytech, a new home for our culinary research team began to take shape.

This would be the largest kitchen renovation of my lifetime. Like all renovations, it involved countless decisions and detours. For example, one special feature of this historic building was the quartet of stunning skylights that formerly illuminated the 4,600 square foot penthouse space. They had long ago been broken and boarded up, but RRC Polytech senior management made the decision to preserve



Early day conception of the new lab drawn in my best pencil crayons. The final layout was not far off this concept.



one above our demonstration kitchen. This turned out to be a useful decision in other ways: most of the large equipment had to come in through this skylight because there was no service elevator to the 11th floor.

To allow for new water and drainage lines, a false floor had to be created above the original hardwood floors creating the need for a ramp at the entrance. Then the ceilings were dropped about two feet to accommodate new ventilation. Although we lost the spacious warehouse feeling, we gained stunning views of the downtown Winnipeg skyline to the north and east via the penthouse's original porthole windows. Each window maintains its original casing from 1905. We even managed to retain a few pieces of marble for the sit-up counter from material left over from the other ten floors.

After one year, our new home was completed on time and on budget. We moved into our new space in August 2019. The official launch of Prairie Research Kitchen took place November 2019.

The new home finally allowed us to expand our team and work in a shared space where we could brainstorm, cook, experiment, and collaborate with clients.

## Becoming RRC Polytech's Third Technology Access Centre (2019-2024)

A renovation on its own is a daunting task. However, we had another challenge to tackle, as well: securing funding to become RRC Polytech's third Technology Access Centre (TAC).

Writing a TAC grant application is like writing a business plan. You must demonstrate market need for your research capabilities, prove that you are backed by an experienced and committed senior leadership and management team, and highlight your commitment and ability to hiring students. You must outline how and why you require the investment from NSERC, how you will leverage that investment to bring in additional revenue, and, most importantly, how you will provide a return on that investment to benefit Canada - for instance, through increased innovation and economic advancement for industry, and contributing to future generations through student training.

TAC proposals require support from industry in the form of letters and past engagement. The College also hosted a day-long event for the grant's evaluation committee that featured the participation



of our industry partners. An event of this magnitude and importance took months to plan, and involved organizing the evaluation team, industry and academic partners, government stakeholders, and, of course, senior leadership. Our expert communications and events team at RRC Polytech created a day to remember, moving people seamlessly from the welcome breakfast at Jane's Restaurant to presentations and tours of our chaotic construction





site, leaving the technical team to present our plan and talk with clients. The event culminated in a final two-hour question and answer session with the evaluation committee. At the end of this very long day, I was exhausted but excited that everyone in the community had come together to support our bid.

When one evaluator asked how we would possibly achieve the results in our plan with the marketing budget presented, I said I had no doubts that RRC Polytech's top-notch reputation and brand, coupled with the power of our prairie network, would

propel us to success. The next day, as if to prove that point, a company from Alberta called us, thanks to a referral from a partner in Saskatchewan, asking for help scaling up a product using a Manitoba ingredient.

We were awarded the TAC grant in 2019, which now supports our base operations and places us in the TAC

family - a family of 60 members across Canada. The TACs are connected by Tech-Access Canada, which facilitates the sharing of best practices, connects its members to financial and technical resources for our clients, and supports our efforts to help Canadian companies meet their innovation challenges.

Every five years, RRC Polytech must reapply for funding for each of their Technology Access Centres. Our next application will take place in 2024. Backed by 200 projects and the client success stories featured in this book, we are ready to share our story.

## Doubling Our Funding - and Our Output

If you're keeping track of timelines in this story, you'll notice that our successful bid for the TAC grant meant we were running two large grants concurrently. We had already established a pretty good system for conducting research in the first three years of the NSERC-IE grant, so it was now time to hand the research portion of our mission to the TAC team while we focused next on areas where we still wanted to improve and grow. The last two years of the NSERC-IE grant have allowed us to focus on outreach and events with Indigenous partners and communities, and increase student participation from several departments, Culinary, International Business, Life Sciences and Applied Computer Education. Chapter 4 outlines many of the activities we have undertaken to engage with Indigenous students and communities.



## Taking a COVID-19 Detour

In 2019 we had a new plan and a new home high above Winnipeg's beautiful Exchange District. Our staff was expanding, and so was our inventory of specialized equipment. Nothing could stop us - not even a global pandemic.

Being a part of NSERC funding and conducting research with the food industry kept us going throughout the disruption caused by COVID-19, and even allowed us to achieve things we that would have been impossible otherwise.

NSERC supported our efforts through a COVID supplement and an extension of the program end date. Because we were working in the research and food space, we were allowed to continue operations so long as we kept up with the ever-evolving safety regulations.

Thanks to our team's resilience and creativity, we were able to accomplish some unique achievements.

Across Canada, countless restaurants were forced to shut their doors, leaving many of our culinary students without the co-operative education opportunities they needed to complete their diplomas. At the same time, post-secondary institutions were sending students and instructors home, which left our team with a nearly empty building at our disposal.

As fate would have it, I had already been in conversation with Harvest Manitoba, Manitoba's Food Bank network, about creating a high-protein, vegetable-loaded dry soup mix from excess vegetables they received. The disruption to the food industry meant that vegetable excesses were growing. Knowing that, we formed a plan to hire as many students as we could to develop a method for drying the vegetables using the equipment available at Harvest Manitoba. The students would create new recipes using these dried vegetables and scale up operations to produce as many packages as possible. RRC Polytech's School of Culinary Arts provided instructors and space, a private donor provided resources to support the four-month program, and Harvest Manitoba provided ingredients



and packaging. In the end, a team of five students produced 3,000 highly nutritious packages of soup or stew that could each feed a family of four.

Little did we know that things would get worse with COVID before they got better. As the months stretched on, the team continued to work - sometimes at home, sometimes in small cohorts that allowed for social distancing. Working within the confines of constantly changing public health directives, we brought in students whenever we could and kept the project moving.

In that time, Roxanne Kent developed her blueberry sauce (featured on page 96), Jamie Chahine created our online Indigenous Food Business Content (page 94), our CAP tofu project wrapped up, and our collaboration with Big Mountain began. We held every Advisory Board meeting and most of our weekly team meetings online for the next two years.

Those were tough years for everyone. We are grateful for the support of our funding partners and RRC Polytech for helping us continue to operate and respond to a food manufacturing industry that remained very active throughout the pandemic.



## Developing a Food Manufacturing Lab

As our prototyping capabilities expanded and staff began to tackle increasingly large and technically complex projects, it became apparent that our next big challenge was to find ways to scale up our ideas.

Manufacturing food engages food safety, engineering, and food quality - aspects that culinary specialists don't typically have to deal with. However, it's just as important that food manufacturers maintain the taste and texture of food products while producing larger volumes.

Prairie Research Kitchen and RRC Polytech's Life Science department teamed up to bring these two sides together by developing a condiment processing line. The production line consists of a large kettle with agitation capacity, two powerful pumps (screw and

sheer), and a piston filler. The screw pump allows for the processing and filling of chunkier sauces while the sheer pump acts as a large inline blender to make smoother sauces. In combination, they allow food manufacturing students to gain experience using the large equipment they will operate on the job, and they help the PRK team assist clients transitioning to co-packers or starting up their own production.

In the end, this project allowed us to fulfill one of the NSERC-IE grant's original objectives - redeveloping the former culinary kitchens at RRC Polytech's Notre Dame campus. In the future, we plan to create a process that will allow food manufacturing students to scale up student-led recipes developed in culinary classes into safe, shelf-stable products for the Manitoba market. This opens the door for student entrepreneurs to produce their first products for sale at the annual RRC Polytech markets or the Campus Book Store.

## Looking Ahead - The Future of Culinary Research

The NSERC-IE grant is now wrapping up. The food manufacturing line has produced its first run. Our team continues to change and grow as people take on new roles or challenges. Every day, we engage with new partners and ideas.

While the book in your hands doesn't feature every individual client we've worked with over the past eight years, it does reflect the impact each of our partners has had on the results we produce.

The world of research is ever-changing - and for that reason, Prairie Research Kitchen will adapt and grow in the years ahead to new processes, concepts, and realities. A lot of great ideas have started here. We look forward to seeing the products of our creativity and collaborations hit grocery store shelves and reach dinner tables in the years ahead. We can't wait to share the results with you in our next research review in 2025.



# About this Culinary Research Review

An important outcome of receiving government funding is the dissemination of knowledge gained through research to ensure economic prosperity for Canada and the education of future generations. This Culinary Research Review, in the form of a cookbook, takes an engaging approach to sharing the outcomes of applied research conducted since Prairie Research Kitchen began collaborating with industry partners in 2014. By compiling and sharing what we have accomplished over the past eight years, we celebrate PRK's achievements and, we hope, inspire readers with ideas for new advances in food product development and culinary research.

What makes our work unique is the interplay between the two mandates: to help industry produce new food products, and to train students to become tomorrow's culinary industry and research professionals. Each section of this book therefore focuses on the specific ways our culinary research team (and students) have helped industry partners, and highlights the results our collaborations have achieved, while underscoring the opportunities these collaborations have created for students to gain hands-on skills in culinary arts and research.

None of the recipes we share in the following pages are proprietary client formulations; they are recipes using new products we've developed for clients, or recipes that showcase the ingredients our clients produce. All recipes in this book have been fully approved by our clients as examples of what innovation, creativity, and collaboration can accomplish. We maintain strict client confidentiality on any prototypes or formulations developed for industry.

What makes our work unique is the interplay between the two mandates: to help industry produce new food products, and to train students to become tomorrow's culinary industry and research professionals.

Why include recipes at all? Because we learned that when you conduct food research you inevitably amass a collection of great recipes doomed to sit in a database known only to your own researchers and client collaborators. But recipes are meant to be shared and enjoyed. In the context of this research review, they also serve an important purpose by demonstrating the quality of our results through the ultimate test marketing tool - your taste buds. These recipes illustrate the best of what culinary research can accomplish when it brings together food scientists, chefs, and innovative Canadian food companies.

Finally, this research review allows us to show our gratitude to the funders and stakeholders whose belief in our vision has made the past eight years possible.

# Capacity- Building Projects

# 2

Building a research program and creating a new food product have a lot in common. Success depends on combining the right ingredients using the right tools. Then you need to formulate instructions others can follow to achieve consistent results (with enough room for creativity, wherever possible). And, finally, you need a few willing participants to test those results.

We were fortunate to have most of those components in place early on, thanks to resources, expertise and support from the RRC Polytech applied research and academic community. Prior investments in our research infrastructure also made a huge difference. The NSERC Innovation Enhancement grant really pushed us to another level.

The projects and recipes highlighted in this section served as the building blocks of our culinary research program. They allowed us to highlight our expertise and uncover ways to improve. They also provided an apt method for training students and new employees on our process for project completion, prototype creation, and reporting research results to industry.

These capacity-building projects helped us generate awareness with internal and external partners about our capabilities as research and culinary chefs. We featured our work in countless success stories, social media and website content, and outreach events.

The sheer variety of the work we were doing and the range of projects and ingredients we engaged with expanded our skills, boosted our confidence, and gave us opportunities to tweak our systems and infrastructure.

Each example presented in this chapter highlights the strategic approaches we took to delivering positive impacts for the Western Canadian food and agriculture community:

1. Building partnerships
2. Creating awareness through public relations activities
3. Shaping curriculum by bringing research into the classroom and students into our labs, and by highlighting careers and entrepreneurship opportunities in food product development at information sessions
4. Combining RRC Polytech's Culinary and Food Manufacturing programs into one integrated, applied research powerhouse
5. Reaching out to community through presentations, RRC Polytech's Applied Research Day, and more

An additional investment from NSERC opened the door for us to deliver research services as a Technology Access Centre (TAC). Becoming a TAC benefitted our industry partners and students by providing them with access to new resources and partnerships with Canada's nation-wide TAC family.

This investment in our early capacity-building efforts, combined with all the recipes, formulations, and procedures we developed, yielded tangible results we are proud of to this day: new products, career opportunities, companies, and ideas.

Along the way, we created a lot of great food.

# Manitoba Pulse and Soybean Growers

One of our earliest partnerships set the stage for our work in pulses, which has since become a major specialty of our ongoing culinary and research efforts. Our relationship with Manitoba Pulse and Soybean Growers (MPSG) has also been one of our most long-lasting, and planted seeds that grew into projects and innovations that continue to have an impact on our collaborations with industry.

**DID YOU KNOW?** Pulses provide non-animal protein, fibre, and complex carbohydrates. The benefit of adding just a half cup serving of beans per day to your diet has been shown to have a positive effect on diabetes, heart disease, and weight control.

The capacity-building projects to follow are only two examples of several projects undertaken with MPSG (see, for example, the CAP Tofu project on page 38). Over the past eight years, we have achieved the long-term objectives of our partnership with MPSG: to help fulfil its research mandate by discovering and developing novel uses for pulse and soybean products.

Our culinary research team is proud of the role we have played in increasing pulse consumption for the health of consumers in North America. As more recipes become available to the public, pulses will become easier to incorporate into a variety of foods - including many suitable for scale-up to larger audiences such as foodservice and retail, and others that will become the basis for new product lines.

## PROJECT 1: NON-TRADITIONAL USES OF PULSE FLOURS WITH SENSORY AND NUTRITIONAL COMPARISONS

MPSG provided funding in 2015 to develop recipes showcasing a variety of edible bean products, including flours, purées, and ready-to-eat beans. These recipes were aimed at promoting pulses as a source of protein, fibre, and other essential nutrients during the International Year of Pulses in 2016.

The project combined science and culinary expertise to develop 10 new recipes for baked goods, snack foods, desserts, pastas, soups, and other food products.

RRC Polytech students, under the supervision of instructors, were tasked with maximizing the quantity of bean flour that could replace wheat flour in a set of existing recipes without affecting the taste or texture of the final product. Our goal was to help consumers add half a cup of beans per day to their diet through one or two different products, in accordance with dietary recommendations made by Pulse Canada.

Following a series of consumer taste trials, our team concluded that it was possible to replace 25 to 40 per cent of the wheat flour content in these recipes with bean flour.



International Year of Pulses celebration event, January 2016



Following a series of consumer taste trials, our team concluded that it was possible to replace 25 to 40 per cent of the wheat flour content in these recipes with bean flour. The nutritional analysis revealed an increase in the protein and fibre content for each recipe.

What we learned about these different bean flours, including their taste profiles, nutritional impact, and effect on structure, benefited not only the students, who will go on to become tomorrow's culinary and research professionals, but our culinary industry and the consumers it serves.

Another of our project priorities was outreach, which led us to showcase the results of our research at events where we introduced chefs, instructors, and foodservice personnel to new pulse ingredients they could incorporate into recipes for restaurants, catering, or institutional cooking such as hospitals, universities, or long-term care facilities.

We held an event to celebrate the launch of International Year of Pulses in January 2016. RRC Polytech hosted producers, consumers, food ingredient manufacturers, media, and other foodservice representatives at Jane's Restaurant at the Paterson GlobalFoods Institute, where we served a delicious menu featuring mouthwatering foods derived from the research project.



We also promoted the project to local media, drawing public and industry attention to the benefits and versatility of pulses. Our media appearances include a CTV Winnipeg Breakfast Television interview featuring our Black Bean Perogies (which happen to be the all-time favourite recipe of Prairie Research Kitchen's director, Mavis McRae - see page 131 for an alternative version of this recipe). Our work on this project was featured in *Food in Canada: Canada's Food and Beverage Magazine*. The perogies also made the trip down to New Orleans for the Research Chef Association annual conference, highlighting the work of industry partner Best Cooking Pulses (now Avena Foods).

# Chicken Pot Pie with Pinto Bean Crust

YIELD: 10 SHELLS FOR FRENCH ONION SOUP BOWLS

## PIE DOUGH CRUST

300 g	pastry flour
170 g	pinto bean flour
10 g	salt
10 g	granulated sugar
285 g	Crisco shortening
130 g	ice water
12 sheets	parchment paper
As needed: all-purpose flour (for dusting)	

## POT PIE FILLING

1 kg	chicken meat, cooked and diced into 3/4-inch cubes
1 L	chicken stock or flavourful broth, heated
100 g	butter or margarine
75 g	all-purpose flour
50 g	pinto bean flour
500 ml	milk, hot
500 g	mushrooms, quartered
175 g	onion, fine dice
20 ml	garlic, fine mince
100 g	butter or margarine
45 ml	basil leaves, fresh, course chop
150 ml	white wine
to taste	salt and pepper
15 ml	tabasco sauce
20 ml	Worcestershire sauce
Half lemon	
500 ml	whip cream, scalded
500 ml	frozen peas, thawed
1 large	red pepper, 1/2 inch diced and blanched

## Dough

1. Cut the shortening into small pieces and scatter on a parchment paper-lined cookie sheet. Place in the freezer for 40 minutes to completely chill the shortening.
2. Sift the two flours, sugar, and salt into a large stainless-steel bowl. Using your fingers (or pastry knife), crumble/cut the chilled shortening into the flour mixture until coarse crumbs are formed. Pour in water and quickly/lightly form the dough.
3. Place the dough onto a parchment-lined pan and press to about 1 1/2 inches thick. Cover completely with cling film and let rest in a refrigerator for a 1/2 hour.
4. Remove the dough from the fridge. Scale the dough off to 90 g balls.
5. Lay a sheet of parchment paper on a worktable and dust with all-purpose flour. Place one ball on the paper and dust with the all-purpose flour. Place a second sheet of parchment on top and roll the dough out. Roll a bit on one side, flip the dough over, lift the top sheet off, and lightly dust. Flip the dough over again, lift the other sheet off, and dust again.
6. Keep rolling and repeating the dusting procedure above until the dough is approximately 1/8 of an inch thick.
7. Repeat with the remaining balls of dough.
8. Cover again with cling film and refrigerate the disks for another 20-30 minutes.





### Filling

1. In a 10-inch, non-stick sauté pan, add 100 g of butter and sauté the onions and garlic until tender. Add the mushrooms. Continue to sauté until the mushrooms develop a caramel colour. Season the mushrooms with salt and pepper to taste. Add the white wine and cook until the wine has reduced until nearly dry (*au sec*). Add the basil and remove from the heat.
2. In a 7-quart heavy-bottom saucepan, melt 100 g of butter. Add the two flours and cook over low-medium heat for 10 minutes, stirring constantly.
3. Gradually blend the heated chicken stock into the white/blond roux (cooked flour butter mixture) along with your milk and stir. Whisk the mixture using a wire whisk (only if your saucepan is stainless steel) to remove any lumps. Simmer for 23 minutes and remove from the heat. Add the whipping cream, tabasco, Worcestershire, and lemon juice. Check for seasoning and adjust if necessary.

4. Add the cooked chicken meat, cooked pinto beans, peas, and red pepper. Remove from heat. Chill completely, cover with cling film once chilled, and refrigerate until needed.

### Pot pie

1. Preheat the oven to 350°F. Divide the filling evenly between 10 French onion soup bowls. Brush the lip of each soup bowl with egg wash. Cover each soup bowl with a round lid of pie crust, cut a hole in the middle to vent. Crimp the edges.
2. Place the soup bowls on a sheet pan and bake on the lowest rack for approximately 30 minutes or until the crust is golden. Remove from the oven and let rest for 2 minutes before eating.

**NOTE** Cooked pinto beans can be added to the filling for extra pulse consumption.



# Almond and Chocolate Espresso Cake with Black Bean Flour

YIELD: 8 PORTIONS

## DOUBLE LAYER CAKE

1 1/2 cups	all-purpose flour
1/2 cup	black bean flour
2 cups	granulated sugar
3/4 cup	cocoa powder
2 1/2 tsp	baking powder
1 1/2 tsp	baking soda
1 tsp	salt
1 cup	2% milk
1/2 cup	canola oil
2	eggs, large
3 tsp	almond extract
1 cup	boiling water
2 tsp	instant espresso

## CHOCOLATE ESPRESSO ICING

1 1/2 cups	or 3 sticks unsalted butter
1 cup	soft cocoa powder
5 cups	icing sugar
1/2 cup	2% milk
3 tsp	almond extract
1 tsp	instant espresso
2 cups	sliced blanched almonds, toasted
1 cup	fresh berries, assorted

## Double layer cake

1. Preheat the oven to 350°F and place racks on the second lowest shelf. Prepare two 9-inch round cake pans by cutting two circles of parchment paper to line the bottom of each pan and spraying the sides of the pans and the parchment circles with pan release spray.
2. Sift the two flours, sugar, cocoa powder, baking powder, baking soda, and salt into the bowl of a stand mixer or a medium stainless-steel bowl. If you're using a stand mixer, use the whip attachment to thoroughly mix the dry ingredients on low speed.
3. In a separate stainless-steel bowl, whisk the eggs and then add the milk, canola oil, and almond extract. With the mixer on low-medium speed, add your egg mixture to the dry ingredients and run the machine for 40 seconds. Stop the machine and scrape the bottom of the bowl with a rubber spatula.
4. Add the boiling water to the instant espresso to dissolve. On low speed, add the espresso liquid to the bowl. Once the espresso has absorbed, turn the machine on high for 1 minute to incorporate air into the batter. Stop the machine and scrape the bowl one more time. Run on high for 20 more seconds.
5. Divide the batter equally between two prepared cake pans. Bake for approximately 35-40 minutes. Check after 30 minutes by inserting a toothpick into the centre of the cake. If it comes out clean, the cakes are ready to be removed from the oven. Let the cakes rest at room temperature in their pans on a wire cooling rack. Once at room temperature, cover the cakes (still in their pans) and refrigerate for 2 hours or overnight. Remove the cakes from the pans and decorate with the chocolate espresso icing (below), toasted sliced blanched almonds, and fresh berries.

## Chocolate espresso icing

1. Heat the milk, almond extract, and instant espresso in a small saucepan until hot (but not boiling) and the espresso is dissolved. Cool the liquid in a refrigerator.
2. In a stand mixer using the whip attachment, and starting at a low speed, whip the butter with the cocoa powder until soft and creamy. In turns, add 1 cup of the icing sugar with 1 tbsp of milk mixture and beat until incorporated. Repeat the above step until all the milk and sugar have been combined. Lower the bowl and scrape the bottom and sides with a rubber spatula. Raise the bowl up and turn the machine on high for 1 1/2 minutes to whisk the icing fully.
3. If the icing appears to be too dry, whisk in milk 1 tbsp at a time until it reaches the proper consistency. If the icing appears to be too wet, add some icing sugar 1 tbsp at a time to reach the right consistency.
4. Use either a baker's straight stainless-steel spatula or a rubber spatula to decorate the cake.

# Gluten-free Soda Crackers with Fresh Thyme

YIELD: 3 DOZEN CRACKERS

230 ml	cornstarch
160 ml	pinto bean flour
75 ml	tapioca flour
115 ml	red quinoa (or black)
5 ml	baking powder
5 ml	xanthan gum
75 g	unsalted butter, cold and cut into cubes
200 ml	2% milk
30 ml	fresh thyme leaves, chopped coarse
	Kosher salt as needed



1. Add the red quinoa to a medium stainless-steel bowl. Sift the cornstarch, pinto bean flour, tapioca flour, baking powder, and xanthan gum into the bowl with the quinoa.
2. Rub the butter into the sifted ingredients and quinoa until coarse crumbs form. Mix in the grated cheeses and thyme.
3. Add the milk and mix until just barely combined. The dough will seem too wet. Let it rest, covered and refrigerated, for a 1/2 hour.
4. Remove from the refrigerator and divide the dough up into 5 equal sections. Roll one section at a time between two generously pinto flour-dusted sheets of parchment paper until each is 1/16 inch thick.
5. Carefully remove the top layer of the parchment paper. Using a 2-inch round pastry cutter ring, cut out the dough. Place the cut rings on a parchment paper-lined half sheet pan/cookie pan. Repeat with the remaining 3 sections of dough. Place on 2 new half sheet pans.
6. Preheat the oven to 375°F and place your rack on the second lowest shelf. Lightly sprinkle each cut-out circle with kosher salt. Bake for approximately 20 minutes. Check for doneness by biting into one of the crackers. If it is still chewy and not crisp, continue baking until it is.
7. Remove the crackers from the oven once crisp and allow to cool to room temperature. Place the crackers in an airtight container until they are needed.

## PROJECT 2: BEST PRACTICES FOR BEAN COOKING

According to market research, many consumers develop negative perceptions of pulses after cooking them improperly. Unfortunately, the information available to consumers about how to properly cook dried beans is inconsistent and sometimes contradictory. Consumers must also choose between the long cooking time of dried beans and the higher sodium content found in canned beans.

This 2018 project set out to create better guidelines for cooking dried pulses in different water conditions. It had a culinary focus split into two main objectives.

This 2018 project set out to create better guidelines for cooking dried pulses in different water conditions.

The first was to survey the wide range of advice found in bean cookery, from cookbooks and industry guidelines to package instructions, about the impact of salt, brining, and water hardness on cooking beans.

The second objective was to characterize the difference between a chef's opinion of a perfectly cooked bean (i.e. "soft enough to chew") versus the

scientific cook times using analytical equipment such as the Mattson Bean Cooker to measure how different treatments impact cooking time. The chefs involved in this research project compared the sensory characteristics of navy, black, pinto, and kidney beans cooked to technical "doneness" against beans cooked past the "doneness" state to establish the ideal cooking time.

In this part of the project, we also conducted consumer testing to measure the impact of different salt treatments on flavour, texture, and appearance.

The knowledge we have shared from this project is helping industry improve the consumer experience with dried pulses as a healthy and affordable protein source.

### The perfectly cooked bean

Properly cooked beans have a slightly firm bite and a soft, creamy, smooth texture, and can be chewed easily. They should appear shiny and firm with bright colour, not broken or burst from cooking.



### Recommended salting methods for different bean types

Trials were conducted on five bean types: kidney, black, faba, navy and pinto. The use of one to two per cent salt reduced cooking time and improved the flavour, texture, and appearance of cooked beans. Cooking time for beans begins when the cooking water reaches a gentle simmer. Water should be kept from vigorously boiling to prevent beans from bursting open.

Based on the study, the cooking recommendations for each bean are as follows:

<b>Navy Bean</b>	2% brine soak (average cook time = 34 minutes)
<b>Black Bean</b>	2% brine soak (average cook time= 28 minutes)
<b>Kidney Bean</b>	1% salt in cooking water (average cook time = 36 minutes)
<b>Pinto Bean</b>	1% salt in cooking water (average cook time = 26 minutes)

Researchers concluded a little salt goes a long way in improving the overall flavour of beans.

## Soaking beans in salt brine

1. Prepare a 2% salt brine by adding 2 1/2 tsp of salt to 3 cups of water, then stir until fully dissolved.
2. Add 1 cup clean, dry beans to the brine and soak for 24 hours at room temperature.
3. Drain the beans.
4. Bring 4 cups of fresh distilled water to a boil.
5. Add the soaked beans to the boiling water and reduce the heat to a gentle boil.
6. Cook the beans until they are firm yet tender and can be easily chewed.

## Cooking beans in salted water

1. Soak 1 cup clean, dry beans in 3 cups of distilled water for 24 hours at room temperature.
2. Drain the beans.
3. Bring 4 cups of fresh distilled water to a boil. For a 1% salted cooking water, add 1 1/2-2 tsps (9-11 g) salt. For a 2% salted cooking water, add 3 1/2 tsps (20 g) salt.
4. Add the soaked beans to the boiling water and reduce the heat to a gentle boil.
5. Cook the beans until they are firm yet tender and can be easily chewed.

Based on our trials, cooking beans in hard and soft water increases the cooking time and decreased the cooked quality.

## A note on hard water

Cooking beans with hard water can greatly impact the cooking time and quality of the beans. Hard water can be found throughout Manitoba and is categorized by the level of calcium carbonate in the water:

Water Quality	Concentration (mg Calcium Carbonate/L)
Soft	0-60
Medium Hard	60-120
Hard	120-180
Very Hard	180+

Most communities in Manitoba use some degree of hard water:

Community	Concentration (mg Calcium Carbonate/L)
Winnipeg	Medium Hard (81)
Brandon	Hard (150)
Portage la Prairie	Very Hard (220)
Dauphin	Very Hard (229)
Neepawa	Very Hard (295)
Melville	Very Hard (309)
Morris	Very Hard (420)

Source: [aquatell.ca](http://aquatell.ca)

Based on our trials, cooking beans in hard and soft water (vs. distilled water) increases the cooking time and decreases the cooked quality. This effect is more prominent in larger kidney beans, where cooking time increases by 17% for soft water and 70% for hard water, and less prominent in black beans, where cooking time increases by 2% for soft water and 17% for hard water.

However, when cooking in either soft or hard water, the seed coat becomes hard and chewy, and the cooked bean fails to achieve the desired smooth, soft, creamy texture. Overall, the effect of hard water on the quality of cooked kidney beans was most pronounced.

# Southwest Bean Salad

YIELD: 4 CUPS/SERVINGS

1/2 cup	black beans, cooked
1 cup	cherry tomatoes, quartered
1/2 cup	cilantro, chopped
1/3 cup	red onion, slivered
1/2	of one jalapeño, seeded, minced
1 cup	corn, toasted
1 cup	bell pepper, diced

## SOUTHWEST LIME DRESSING

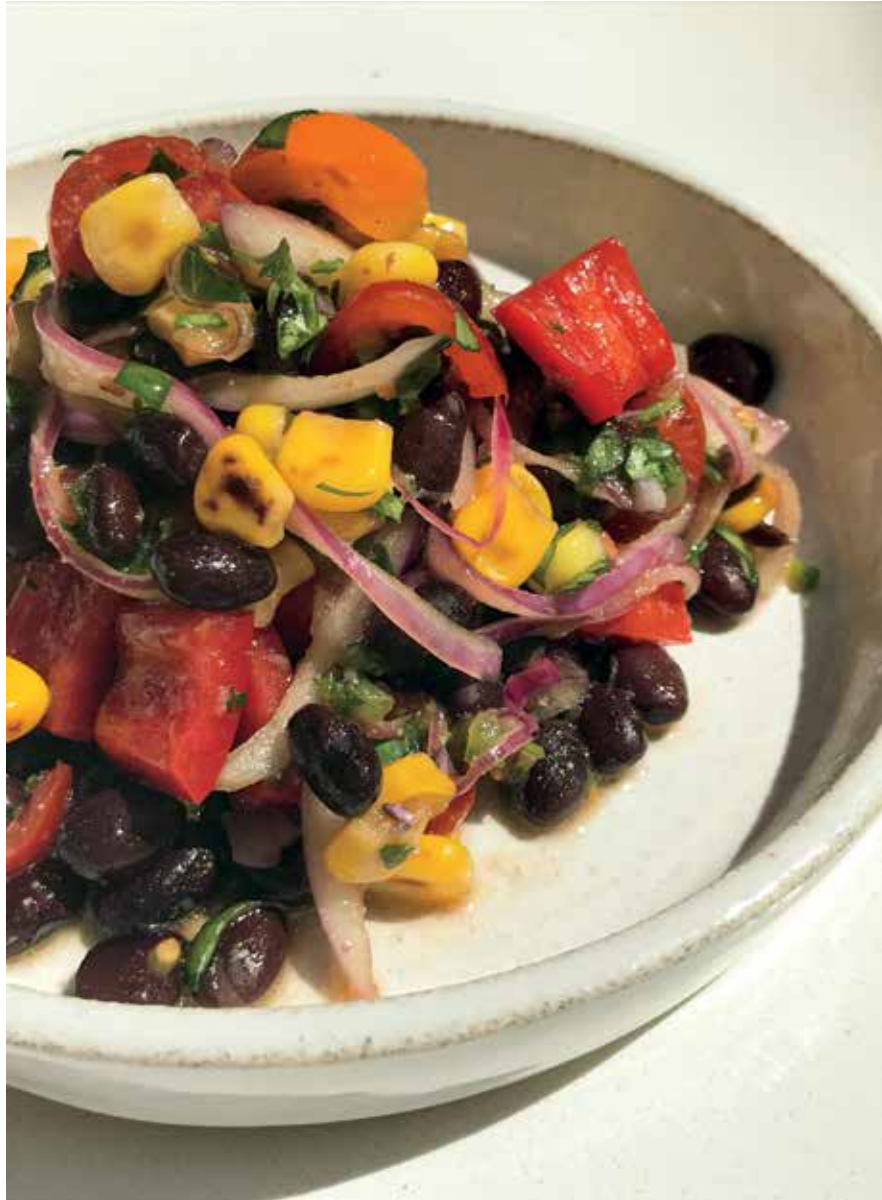
1/3 cup	lime juice, fresh
1/4 cup	canola oil
2 tbsp	honey
1 tsp	cumin, dry ground
1/2 tsp	salt

## OPTIONAL ADDITIONS

Avocado, chickpeas, cucumber, cotija cheese, quinoa, grilled chicken, etc.

1. In a large mixing bowl, add all the ingredients for the bean salad and set aside.
2. In a medium-sized mixing bowl, whisk together the ingredients for the dressing. Adjust seasoning as desired.
3. Pour the dressing over the salad and stir until well coated.

Serve immediately, or refrigerate for a few hours, then stir again and serve.



# Manitoba Ag Protein Competition

Starting in 2019, RRC Polytech culinary students have been asked to participate in a recipe competition hosted by Manitoba Agriculture, an event that raised awareness and profile for our research program and its connection to the College.



Engaging students in RRC Polytech's culinary research and innovation initiatives to develop new recipes has been a priority for us since the early days. Recipes are the foundation of all consumer product prototypes. Bringing students into the recipe development process gives them crucial hands-on experience, while industry partners benefit from our students' expertise and creativity. Our tag line, *Great ideas start in the kitchen*, reflects the spark that science, innovation, and education can strike when brought together in one place. This competition event was one of the first opportunities to showcase what makes our approach valuable and unique.

The students faced off against a pair of culinary students from Assiniboine Community College on March 19 - Agriculture Awareness Day - in the Golden Boy Dining Room of the Manitoba Legislative Building. The theme of the competition was *Innovation by Protein*. One student from each school was challenged to create an appetizer featuring bison. The other students were challenged to create an appetizer featuring peas.



The students prepared in advance one full, plated, and displayed serving of their appetizer along with 130 samples. At the event, each student pitched their appetizer to a panel of judges, then answered one question from the emcee before the samples were distributed. Attendees voted on the best appetizer and the winner was one of our students, Peter Matkowski, who took first place for his Bison Meatballs appetizer. Our second student, Anna Borys, used the Pea Tempeh she developed for another project (see page 37) for her Tempeh Nachos recipe.

RRC Polytech students competed again in early 2020 before the COVID-19 pandemic prevented us from participating in later iterations of this competition. At least a couple tasty recipes were preserved from the event.

Each student prepared in advance one full, plated, and displayed serving of their appetizer along with 130 samples.



# Bison Meatballs with Pickle Mustard Gravy and Blueberry Sauce

YIELD: 12 MEATBALLS

## BISON MEATBALLS

1 1/2 tsp	kosher salt
1/2 tsp	marjoram, dry leaves
1/4 tsp	caraway, ground
1/8 tsp	nutmeg, ground
1/8 tsp	ginger, dry, ground
1/4 tsp	white pepper, ground
1/2 cup	panko breadcrumbs
1	egg
1/4 cup	milk
1 lb	bison meat, lean ground
75 g	pork fat, ground

## PICKLE MUSTARD GRAVY

1/4 cup	onion, small dice
3 tbsp	butter
3 tbsp	all-purpose flour
2 tbsp	Dijon mustard
1 cup	pickle juice



### Bison meatballs

1. In a small bowl, combine the salt, herbs, and spices. In the bowl of a stand mixer fitted with a paddle attachment, add the panko, egg, milk, and spice mixture. Mix on medium speed for about 2 minutes, scraping the sides as necessary.
2. Add the bison and pork fat to the breadcrumb mixture and mix on medium speed until evenly dispersed, about 1-2 minutes.
3. Heat your oven to 425°F. Line a sheet pan with aluminum foil and grease the foil. Roll golf ball-sized meatballs and place them evenly on the tray without touching each other. Roast them in the oven for 20 minutes until their internal temperature reads 165°F.

### Pickle mustard gravy

1. In a small saucepan over medium-high heat, sauté the onion in butter until the onion starts to caramelize. Whisk in the flour. Cook for 2-3 minutes until it just starts to brown slightly. Add mustard and stir. The mixture should dry up and clump together. Cook for another 2 minutes. Slowly add the pickle juice in stages, only adding the next portion after the last has incorporated. Once all the juice has been added, turn the heat to low and simmer until the sauce thickens slightly. Remove from heat.
2. Serve the meatballs with gravy, and a dollop of blueberry sauce on top (see page 96).

# Tempeh Nachos with Roasted Corn Salsa and Lime Crema

YIELD: 4 SERVINGS

## TEMPEH NACHO MIXTURE

1 tbsp canola oil  
1/4 cup onions, small dice  
1 tsp garlic, minced  
1/2 lb tempeh, crumbled  
2 tbsp taco seasoning  
1/3 cup water  
Salt to taste

## ROASTED CORN SALSA

1 cup corn kernels  
2 whole jalapeños, charred, small dice  
3 tbsp red onion, small dice  
2 medium Roma tomatoes, small dice  
1/4 cup cilantro, chopped fine  
Juice of 1 lime, fresh  
1 tbsp garlic, minced  
1/2 tsp kosher salt  
1/4 tsp sugar  
2 tbsp canola oil

## LIME CREMA

1/2 cup sour cream  
Zest of 1 lime  
1 tbsp lime juice, fresh

## NACHOS

1 large bag nachos  
3 cups nacho cheese blend  
Tempeh nacho mixture (1 recipe - see above)

## GARNISHES

1 avocado, diced  
1/4 cup green onion, chopped  
2 medium radishes, thinly sliced  
1/2 cup cherry tomatoes, quartered

## Tempeh nacho mixture

1. In a medium non-stick pan, heat the canola oil over medium heat and sauté the onions until just softened, about 2 minutes.
2. Add the crumbled tempeh and garlic and cook for another 4-5 minutes until the tempeh starts to caramelize.
3. Add the taco seasoning and water and cook down until the mixture thickens. Season to taste. Transfer to a small bowl to cool.

## Roasted corn salsa

1. In a medium bowl, combine the corn, chopped jalapeño, onion, tomatoes, and cilantro.
2. In a small bowl, whisk together the lime juice, garlic, salt, sugar, and oil.
3. Pour the dressing over the corn mixture and stir until well coated. Set aside, or chill until required.

## Lime crema

1. Stir together all ingredients and chill until required.

## Assembly

1. Set the oven to 375°F. Line a sheet pan with parchment paper. Lay down one thin layer of taco chips. Top with the cooled tempeh nacho mixture, and then top with 1 cup of the cheese. Repeat 2 more times until all chips, tempeh mixture, and cheese are used up. Bake for 10-12 minutes until the cheese is melted and lightly bubbling. Be careful not to let the nachos burn.
2. Pull from the oven and top with garnishes. Serve with chilled corn salsa and lime crema.



# MAHRN BSG Miso Project

One early capacity-building projects for our Culinary Research team was a collaboration in 2017 with the Manitoba Agri-Health Research Network (MAHRN, led by Lee Anne Murphy), the University of Manitoba's Food Science department, and two industry partners, Farmery Estate Brewery and Torque Brewing. The project's goal was to explore ways to use spent grains from the beer brewing process to produce value-added products.

The first step involved developing viable ideas and researching the process, including a literature review, market research, and ideation - important precursors to coming up with new innovations. From this stage, the team devised the miso and soy sauce applications that would serve as the basis for our research.

Miso is a traditional Japanese seasoning that typically has a salty flavour. A thick paste, it is normally made from fermenting soybeans combined with salt and koji (rice or soy inoculated with the *Aspergillus oryzae* fungus), plus a few other ingredients. Our collaboration put a unique new twist on this ancient culinary staple while demonstrating how the team could work with government and industry partners to find unexpected, innovative commercial opportunities.

As a by-product of the brewing process, spent grains are usually used as animal feed, although more recently they are also used as flour for baking products (see GroundUp eco-ventures, page 69). In this project, researchers explored ways to produce miso using spent grains (malt in particular) rather than soy. The new malt miso developed from this project highlighted how PRK could serve growing industries like Manitoba's brewers by adding value to their processes and bringing new products to market.

The miso was unveiled at a taste-testing event in our research kitchen, where guests sampled popcorn, soup, and pastries seasoned with pale malt miso from Farmery and dark malt miso from Torque.

The spent grain miso project was made possible thanks to funding from a Natural Sciences and Engineering Research Council of Canada Innovation Enhancement grant and from Growing Forward 2, a five-year federal-provincial-territorial policy framework to advance the agriculture industry, helping producers and processors become more innovative and competitive in world markets.



# Candy Cane Miso Caramel Popcorn

YIELD: 12-14 X 50 G BALLS

10 cups	popcorn, popped
1 cup	white sugar
1/4 cup	corn syrup
6 tbsp	butter, unsalted
1/4 cup	water
1/3 cup	dark miso
1/2 tsp	baking soda
1/4 cup	candy canes, crushed
1 cup	shortbread cookies, bite-sized



Popcorn seasoned with malt miso was a hit with the Hon. Ralph Eichler, former Minister of Agriculture and Resource Development for the Province of Manitoba (right), pictured here with Prairie Research Kitchen Director Mavis McCrae.

**NOTE** 80 g or 1/3 cup of popping corn kernels will yield enough popcorn for this recipe.

1. Place the popcorn into a large bowl. Remove any un-popped kernels and add the broken shortbread cookies.
2. In a small saucepan, combine the sugar, butter, corn syrup and water. Stir to combine but be careful not to leave any sugar on the side of the pot.
3. Cook over moderate heat, swirling gently. Do not stir the mixture once on the stove.
4. Cook the syrup until it reaches a temperature between 135°C (275°F) and 138°C (280°F). For accurate readings, ensure your candy thermometer reaches the bottom of the pot.
5. If a crunchy caramel corn is desired, cook to 149°C (300°F).
6. As soon as the syrup reaches the desired temperature, remove the pot from the heat and whisk in the miso and baking soda, taking care to fully incorporate the miso.
7. Working quickly, pour the hot syrup over the popcorn and cookie mixture. Stir until the popcorn is well coated.
8. Add the broken candy canes to the bowl and stir to combine.
9. Pour the caramel corn onto a pan to cool. While the mixture is still warm, form the caramel corn into balls.





## Miso Mustard

YIELD: 18-20 45 ML JARS

120 g	yellow mustard seed, whole
20 g	brown mustard seed, whole
32 g	mustard, dry ground
250 g	apple cider vinegar
70 g	miso paste
3 g	salt
200 g	water
140 g	honey

1. Combine the mustard seeds, 200 g of the vinegar, and 100 g of the water in a plastic container.
2. Cover and leave at room temperature for at least 18 hours until the mustard seeds are swollen and the liquid fully absorbed.
3. Add 150 g of soaked mustard seeds, dry mustard, 100 g of vinegar and 50 g of water to a blender.
4. Blend on high for 60 seconds until a smooth paste forms.
5. Combine the paste with the remaining ingredients and soaked seeds in a sauce pot.
6. Heat while stirring constantly to 82°C.
7. Pour in 2 500 ml deli containers and refrigerate.

# Pea Tempeh

The Pea Tempeh research project was launched under the guidance of Prairie Research Kitchen to train a culinary research student in the process of developing cultured food products.

One of the project's secondary goals was to bolster outreach to the local community and disseminate knowledge generated by the research. The project entered to compete in RRC Polytech's 2019 Applied Research and Innovation Day, an annual event where students across the College present and promote their own applied research projects. The Pea Tempeh project placed second at the competition. The project was led by Anna Borys, a culinary research student at the time and now a Culinary Research Assistant at PRK (see page 114).

Tempeh is a nutrient-dense, fermented soybean protein cake first produced in Indonesia thousands of years ago. Fermenting the soybeans with the aid of a tempeh mold culture in a controlled environment promotes the growth of *Rhizopus oligosporus* mycelium. The mold and soy form a cake-like product that can be used as a protein source in everyday dishes. The fermentation process triggers an increase in certain amino acids, which improves the nutritional value of the protein found in tempeh.

Rising consumer demand for allergen-free products led Anna to explore the possibility of developing a tempeh made with yellow peas instead of soy that would be suitable for commercial production.

Anna also researched the impact of pH on taste, texture, and fermentation culture growth. Reducing pH is important to food safety: a pH level above 4.6 encourages the growth of pathogens such as *E. coli* and *Salmonella spp.* Adding an acid such as vinegar to the tempeh fermentation process prevents this growth and leads to safer food production. However, acid also impacts texture and cooking time.

Results from the project demonstrated that tempeh can indeed be made allergen-free using peas instead of soy - a discovery that opens possibilities for black, navy and fava beans, as well as other prairie-grown legumes.

The research determined that the optimal pH level for the safe production of yellow pea tempeh was 4.3 (0.1 grams of vinegar) and a cooking time of 38 minutes with a fermentation time of 48 hours. Anna concluded that pH levels do impact the texture of peas. Lower pH levels result in firmer cooked peas and a pH below 4.3 results in an unpleasant taste and aroma.

The tempeh was used by students participating in the Manitoba Agriculture competition - see page 30.

The Pea Tempeh project benefitted enormously from the assistance of Sam Owsianski, Industry Liaison Manager for Research Partnerships & Innovation (RPI) at RRC Polytech, who acts as a vital link between our research team and the vast college ecosystem that supports RRC Polytech's research mandate through resources and expertise.



Rising consumer demand for allergen-free products led Anna to explore the possibility of developing a tempeh made with yellow peas instead of soy that would be suitable for commercial production.

# Prairie Plant Protein Project

More products featuring plant-based proteins are filling today's grocery shelves than ever before, thanks to a growing market for food products containing alternative sources of protein. Prairie Research Kitchen has positioned itself at the forefront of many plant-based protein innovations - especially around pulses, which grow abundantly on the Prairies and present endless opportunities for research centred on new ingredient applications and product development.

In 2019, Prairie Research Kitchen led the Prairie Plant Protein Project in collaboration with the University of Manitoba's Department of Food and Human Nutritional Sciences and the ARD-Food Development Centre (ARD-FDC), with funding from Manitoba Pulse & Soybean Growers (MPSG), Canadian Agricultural Partnership (CAP), and Ag Action Manitoba.

The project's goals were to explore the functionality of different pulses for plant protein-based foods, foster partnerships integrating applied and culinary research into Manitoba's research network, demonstrate new plant-based protein options for Canadian consumers, and help increase and diversify the range of foods Canadians eat while highlighting the versatility of plant-protein sources.

The first phase of the project was undertaken by our project partners. Various pulses were assessed at the University of Manitoba's Food and Human Nutritional Sciences lab for specific protein attributes associated with tofu quality in soybeans. Results

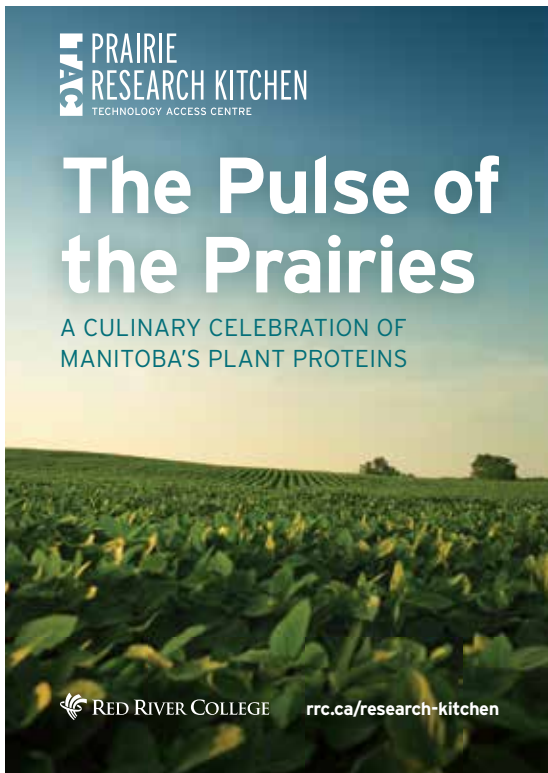
suggested fava beans featured a profile suitable for making tofu, which shaped the protein blends developed in later phases. Next, researchers at ARD-FDC established a process to extract the pulse proteins on a scaled-up basis.

The Prairie Research Kitchen team brought both pieces together by testing the variability of protein source combinations and the suitability of each for creating new tofu-like blocks. The team also tested the plant protein sources identified in the first phase of the project to determine their nutritional profiles. Our end goal was to combine complementary amino acids from pulses, soybeans, and hemp to create complete protein sources.

Results suggested fava beans featured a profile suitable for making tofu, which shaped the protein blends developed in later phases.

Our end goal was to combine complementary amino acids from pulses, soybeans, and hemp to create complete protein sources.





In 2021, PRK co-published *The Pulse of the Prairies: A Culinary Celebration of Manitoba's Plant Proteins*, a promotional cookbook showcasing the development and use of prairie-grown plant protein sources which marked the culmination of the Prairie Plant Protein Project.

### Completing the Protein Puzzle

Humans need to consume *complete* proteins that provide all the amino acids (organic compounds) we need for optimal health. While proteins from animal sources are complete, proteins from plant sources often contain incomplete amino acid profiles. That's why we often combine rice and beans, for instance, in a single dish: alone, neither has all the amino acids our bodies need, but together they do. That's also why blending plant-based proteins from different sources is such an important element of our product formulation: we want to ensure the products we develop for consumers and clients contain a complete protein.

After several varieties of novel tofu were developed, including a new take on traditional soy tofu with hemp protein, Prairie Research Kitchen's chefs transformed the tofu into delicious new food applications and recipes.

The knowledge derived from this project later became the basis for future research and product development with other partners, including Big Mountain and Prairie Fava (see pages 71 and 59).

*This project was made possible thanks to funding from a Natural Sciences and Engineering Research Council of Canada Innovation Enhancement grant, Manitoba Pulse and Soy Growers and the Canadian Agricultural Partnerships grant along with industry supplied ingredients.*





# Soy Tofu

YIELD: 575-600 G

## SOY MILK

2 1/2 cups hydrated soybeans, soaked overnight  
2 L water

## SOY TOFU

1.5 L soy milk  
1/4 cup water  
4 tsp calcium sulphate

### Soy milk

1. Drain the soaked soybeans and add them to a large blender with the water. Blend on high until completely smooth. (Speed 10 for 3 minutes). You may want to do this in two batches to accommodate the size of the blender, making sure you have an even amount of bean-to-water ratio with each batch.
2. Transfer the pureed mixture to a large stainless-steel pot and bring to a light simmer, stirring constantly. Simmer at 95°C for 10 minutes.
3. Remove from heat and strain the mixture through cheesecloth. Squeeze out all the liquid and discard the solids.

### Soy tofu

1. Heat the soy milk to 85°C. Remove from heat.
2. In a small bowl, combine the water and calcium sulphate to dissolve. Gently stir this into soy milk.
3. Allow the mixture to sit covered for 30 minutes.
4. Gently stir, or using a rubber spatula, "slice" up the curd in the pot after 10-15 minutes.
5. Ladle off the clear whey, then pour the remaining curds and whey into a prepared mold lined with cheesecloth. (The mold should have a diameter of 16 cm and a height of 10.5 cm.)
6. Fold the cheesecloth over the curd, add a second mold on top of the covered curd, and press gently with a large soup can or 1 kg weight.
7. After 30 minutes, place the cheesecloth-covered tofu into a bowl of ice water. Allow to chill completely.
8. Gently remove the tofu from the cheese cloth. Cover and refrigerate until required.

# Pistachio Coconut Crème Pâtissière

YIELD: 2 CUPS

1 cup	tofu
1/2 cup	white sugar
5 ml	vanilla bean extract
4 tbsp	margarine, cubed
1/2 cup	corn starch
450 ml	water
1/4 cup	pistachio paste
1/4 tsp	lemon extract
1/4 tsp	coconut extract

**NOTE** Makes for a great filling for any filled dessert such as doughnuts, cream puffs, or Napoleons.

1. Blend the tofu in a blender. Slowly incorporate the water a bit at a time.
2. When combined, transfer to a medium-sized pot and bring to a simmer while stirring constantly so the mixture does not stick to the bottom.
3. Add the vanilla extract and sugar. Stir until the sugar is completely dissolved.
4. Whisk in the pistachio paste, lemon extract, and coconut extract. Stir to combine.
5. In a small bowl, whisk together the corn starch and water. Add to the pot and stir vigorously for 4 minutes.
6. Remove from heat and add the margarine. Mix well.
7. Strain through a fine mesh sieve and place in a container to cool.
8. Once cooled, whip the crème pâtissière in a mixer fitted with the whip attachment. Whip until the crème is airy and has reached a creamy consistency.





# BBQ Tofu Steam Buns

YIELD: 18-20 BUNS

## BBQ TOFU

1 package extra firm tofu  
4 tbsp hoisin sauce  
2 tbsp sesame oil  
2 tbsp rice wine vinegar  
2 tbsp soy sauce  
2 tbsp ginger, minced  
2 tbsp green onion, sliced

## STEAM BUN DOUGH

1 1/3 cups water, warm (21°C)  
1/4 cup + 1 tbsp non-fat milk powder  
1 tbsp instant yeast  
3 1/2 cups bread flour  
1/3 cup potato starch  
2 tsp fine table salt  
1/3 cup + 1 tbsp white sugar  
2 tbsp canola oil

**NOTES** This steam bun dough can be filled with the filling of your choice. The tofu in this recipe can be replaced by pork or chicken for a non-vegetarian version.

## BBQ tofu

1. Slice the tofu into six 2 cm thick slabs.
2. Combine the hoisin, sesame oil, rice wine vinegar, soy sauce, and ginger in a small bowl. Whisk well to combine into a glaze.
3. Brush one side of the tofu slabs with the glaze. Place the tofu glaze-side down on a preheated, well-oiled grill. Flip the tofu every 2 to 3 minutes, brushing extra glaze on the tofu every time it is flipped. Cook for approximately 10 minutes or until the tofu is well browned with a sticky crust.
4. Roughly chop the grilled tofu into small cubes and toss with the remaining glaze and green onions. Set aside.

## Steam bun dough

1. Combine the water, yeast, and milk powder in the bowl of a stand mixer. Whisk to dissolve the milk powder.
2. Add all remaining dough ingredients.
3. Mix with a dough hook at medium speed for 10 minutes until a smooth dough is formed.
4. Transfer the dough to a lightly oiled container and cover with plastic wrap. Place in a warm area and allow to double in size, about 45 minutes.

## Assembly

1. Turn out the risen dough onto a clean work bench.
2. Roll the dough into an approximately 50 cm long rope.
3. Using a bench scraper or knife, cut the dough into 18-20 equal-sized pieces.
4. Roll each piece in a tight ball, place each ball on a clean surface, and loosely cover with plastic wrap or a clean tea towel.
5. Leave the dough balls covered for 5 minutes to allow the gluten to rest. This will make the dough easier to roll out.
6. Roll each dough ball into a 12 cm disc. If the dough is difficult to roll to size, let it rest for 2 minutes before continuing to roll it out.
7. To form the buns, place a disc of dough in your non-dominant hand and spoon 1-2 tbsps of BBQ tofu into the middle of the disc.
8. Using your dominant hand, bring the 12 o'clock and 6 o'clock of the dough above the filling and pinch. Do the same with 3 o'clock and 9 o'clock. Seal the top of the bun by pinching the open areas remaining at the top of the dough to form an x. Alternatively, gather the edges of the dough around the filling to form a purse.
9. Place the sealed buns on a parchment-lined steamer basket.
10. Cover the basket and allow the buns to proof for 15 minutes.
11. Once proofed, place the basket over a pot of boiling water and allow to cook for 15 minutes.
12. Remove the buns from the basket and serve warm.

# Gnudi

YIELD: 2 LARGE SERVINGS

1 cup	tofu
1 cup	parmesan cheese, grated
1/4 cup	all-purpose flour
1/2 tsp	kosher salt
1/8 tsp	pepper, ground

1. In a medium-sized mixing bowl, mix the tofu, parmesan, flour, salt, and pepper until well combined.
2. Using a small scoop, portion the mixture into 8 g round balls.
3. Place each gnudi ball onto a parchment-lined baking sheet, cover, and refrigerate for at least 20 minutes.
4. Bring a medium pot with salted water to a boil.
5. Drop the gnudi in the water in batches and cook for 3 minutes. Remove the gnudi from the water and place them on a wire rack.
6. In a medium-sized, non-stick frying pan over medium-high heat, melt 1-2 tbsp of salted butter. Once the butter is melted and starting to foam, add the drained gnudi. Sauté in butter until all sides of the gnudi are starting to brown, about 4-5 minutes.

Serve with your choice of sauce, freshly grated parmesan, and freshly chopped parsley.

**NOTE** To add another layer to this dish, toss with sautéed asparagus, crispy bacon or pancetta, garlic and chili flakes, and garnish with fresh squeezed lemon juice and finely grated lemon zest.



# Vegan Garlic Aioli

YIELD: 2 CUPS

1/2 cup      tofu, medium firm  
1/4 cup + 2 tbsp water  
1/2 tsp      Dijon mustard  
1 tbsp      lemon juice, fresh  
4 cloves     garlic, minced  
1/2 tsp      white granulated sugar  
1 tsp       salt  
1 1/4 cups   canola oil

1. Add the tofu, 1/4 cup water, mustard, lemon juice, garlic, sugar, and salt to a blender. (You can also use a tall cup with an immersion blender.)
2. On medium speed, blend the ingredients until they form a smooth consistency.
3. Scrape down the sides. While the blender is running on medium to medium-high, add the oil in a slow and steady stream, being careful not to add it too quickly. This slow, steady stream will help create an emulsion.
4. Once your emulsion looks like mayo, adjust the seasonings as desired.



**NOTES** If your aioli splits or “breaks”, use the additional 2 tbsp of water (warm water works better) and pour it into the mixture and blend on high. This should bring the mixture back together. If not, start again by emptying the contents of the blender. Add 2 tbsp of warm water, and in a slow steady stream, add the contents back into the blender while it’s running.

Create a chipotle aioli by adding in 1 chopped chipotle pepper, 1 tbsp of adobo sauce, 1/4 cup fresh chopped cilantro, and substitute the lemon juice for lime juice while blending.

# Pulse Canada Foodservice

In this project for Pulse Canada, Prairie Research Kitchen surveyed a wide range of available information about the eating quality of dry beans to develop useful definitions and cooking guidelines for the foodservice industry.

A preliminary market intelligence survey informed us that more members of the foodservice industry would be willing to take up dry beans as an ingredient if they had access to consistent, reliable information about product origins, general cooking quality, food applications available for each bean class, and the differences in quality between canned and dry varieties of each bean class.

Many respondents also indicated that having staff trained in bean cooking would increase bean uptake across the industry. For instance, we learned from culinary professionals who teach that few have enough time to properly teach bean cooking in their courses or programs.

We also conducted quality testing, comparing Canadian dry beans to a well-regarded, high-quality heirloom bean control used in the US. The results indicate that Canadian beans don't greatly differ in quality from US beans. However, we did note quality variations between Canadian suppliers, which suggests that some - particularly those supplying beans to the foodservice industry - may benefit from training in best storage practices to ensure the high quality.

Based on the input we received from the market intelligence survey, PRK also developed several applications to highlight Canadian bean quality in the foodservice space. These applications can be developed further to produce bean ingredients available directly from foodservice suppliers, or they can be prepared on site, from scratch, at foodservice establishments.





## Dry Bean Quality Defined

Based on feedback from foodservice partners during this project, PRK developed a definition of cooked bean quality for foodservice applications:

*In general, a high-quality, perfectly cooked bean would match a 3 on the scale. It would have a creamy texture without being mushy or soft. It would be fully intact and not split, burst, or broken.*

Of course, what is considered an optimally cooked bean may vary by application, so we also included a scale describing the “level of doneness” based on bite and texture. This scale may serve as a useful training tool for classrooms or foodservice industry, or future research projects.

Based on feedback from foodservice partners during this project, PRK developed a definition of cooked bean quality for foodservice applications.

Scale	Description of Cooked Bean Bite and Texture
1 Undercooked	The bean is difficult or impossible to chew and the cotyledon feels hard.
2 Slightly Undercooked	The bean can be chewed but has a grainy texture, and the cotyledon feels slightly hard. The bean breaks down into distinct pieces with chewing.
3 Optimum Cooked	The bean is creamy with no grittiness or grainy mouthfeel, and the cotyledon has some bite and firmness with initial chew.
4 Slightly Overcooked	There is very little resistance to chewing. The bean is losing cohesion but is still mostly intact. The cotyledon feels mushy.
5 Overcooked	Grains are burst and waterlogged, and the bean is easily chewed or pressed into a mush between thumb and index finger.

## Meat-Bean Blends and End Use Applications

The ground beef and cooked bean blends developed by PRK for applications in this project followed a ratio of 75 per cent ground beef to 25 per cent cooked bean.

We determined this ratio after conducting texture profile analysis (TPA), a process that mimics the effect of chewing on the texture of a food product. Our researchers observed that hardness and shear force values dropped dramatically from 100 per cent raw beef patties to those with 25 per cent bean - especially with navy beans, though not as drastically with black beans.

This suggests that bean and beef blends may not have the structural requirements they need to form viable patties without the aid of other functional ingredients.

Our researchers did, however, identify three applications in which the meat-bean blend adds value and nutritional benefits that make them suitable for foodservice applications, including applications where the blend:

- is contained in a dough or wrapper
- is added to high moisture cooking applications such as meat sauces
- is combined with binding ingredients such as eggs and breadcrumbs that hold ingredients together

In high moisture applications, for example, the raw blend thickens the sauce while adding nutritional value (fibre and plant-based protein) and decreasing food costs in large volume recipes.

# White Bean Quiche

YIELD: 9" CIRCULAR QUICHE (700 ML)

200 g eggs  
180 g milk, whole  
172 g white beans, cooked  
1.5 g salt  
0.2 g black pepper

1. Preheat a conventional oven to 350°F/177°C
2. Blend all ingredients in a blender until smooth. Strain using a fine mesh strainer.
3. Bake in a small, greased baking pan or in a prepared crust for 25-30 minutes or until set in the middle.

**NOTE** Any flavourings or additional ingredients can be added after the blending/straining stage.





# Beanie Joes

YIELD: ABOUT 14 X 120 G PORTIONS OF MEAT MIXTURE

850 g	black bean and beef blend	17 g	Worcestershire sauce
17 g	garlic, minced	20 g	hot Dijon mustard
170 g	white onion, small dice	42 g	canola oil
102 g	green bell pepper, small dice	8 g	kosher salt
42 g	tomato paste	4 g	black pepper, ground
170 g	water	2 g	red pepper flakes
255 g	ketchup	14	hamburger buns, toasted
28 g	brown sugar		

1. Heat a large non-stick pan over medium-high heat. Add oil to the pan. Once hot, add the beef blend. Cook for about 2 minutes.
2. Add the onions and peppers and cook for another 2-3 minutes until the veggies are just barely soft. Add the garlic and cook for another 2 minutes. Once the meat is fully cooked, add the tomato paste and stir to combine. Cook altogether for about 1-2 minutes.
3. In a separate bowl, whisk together all remaining ingredients and add to the meat mixture. Bring to a low simmer for 10-15 minutes until the mixture is thickened and has reached Sloppy Joe consistency.
4. Portion one heaping half-cup or 120 g onto the bottom half of a toasted bun. Garnish with your favourite pickle and top with the other half of the toasted bun.



# Bean Tourtière

YIELD: 12 HAND PIES

10 g	canola oil
100 g	onion, small dice
135 g	button mushroom, small dice
50 g	carrots, small dice
50 g	celery, small dice
.50 g	nutmeg, ground
1 g	cinnamon, ground
1 g	allspice, ground
10 g	kosher salt
2 g	black pepper, ground
500 g	dark red kidney beans, cooked
150 g	water
125 g	potatoes, grated
50 g	walnuts, finely chopped
1 kg	pie pastry
250 g	egg wash

1. Heat the oil in a large frying pan.
2. Add in the onions and mushrooms and cook until the onions are soft.
3. Add in the carrots, celery, and spices. Cook until the vegetables are soft.
4. Add in the beans and water. Stir to combine and cook for 4-5 minutes or until the mixture has thickened.
5. Stir in the potatoes and walnuts to combine.
6. Allow to cool before adding to pastry.

## Assembly

1. Roll out your pie pastry into 6-inch circles.
2. Add 100 g of filling into the centre of the pastry. Pull half the pastry over the filling and align with the edges of the other half of the pastry, making a half-circle.
3. Using a fork, crimp the edges of the pastry to seal shut. Cut 3 slits on top of each pastry.
4. Brush each pastry with egg wash and bake at 185°C for 25 minutes or until the top is golden brown.





# Vegan Alfredo Sauce

YIELD: 2 LITRES

740 g	white beans, cooked
1045 g	water, tap
125 g	canola oil
12 g	garlic, minced
37 g	lemon juice, fresh
4 g	nutmeg
7 g	onion powder
20 g	nutritional yeast
12 g	kosher salt
2 g	white pepper

1. Add the cooked beans and water to a blender. Blend for 30 seconds.
2. Pour in the oil and blend for another 30 seconds. Scrape down the sides of the blender.
3. Add in the lemon juice, garlic, and spices. Blend for another 30 seconds. Scrape down the sides of the blender. Blend for another 15 seconds.
4. Use immediately or store in an airtight container and cool.

# Saskatchewan Pulse Growers Lentil Project

In addition to supporting private food producers, Prairie Research Kitchen often works with agencies that support the food industry to drive innovation at the agricultural level.



In 2021, PRK partnered with Pulse Canada and Saskatchewan Pulse Growers to assess the effects of raw and de-flavoured red lentil flour in fried chicken coatings. The study was spurred in part by the rise in competition between quick service restaurants seeking new ways to improve chicken sandwiches.

The overall goal of this study was to generate scientifically backed evidence that speaks to the benefits of incorporating lentil flour in applications like these, and produce results that can be used to encourage adoption of lentil ingredients in the US food service industry.

Led by PRK researcher Bill Ryzniczuk, the team first analyzed de-flavoured and raw red lentil flours for their physical and functional compositions. They concluded that the compositional characteristics of both the de-flavoured and raw lentil flours were

quite similar; flour samples showed only minor differences in moisture content and protein content.

Next, researchers conducted a comparative assessment of the ingredient functionality, flavour, and appearance of deep-fried boneless chicken tenders and bone-in fried chicken thighs with raw and de-flavoured red lentil flour substituted for a portion of wheat flour in the coating.

The results of this study determined that the inclusion of de-flavoured red lentil flour contributes positive attributes to fried chicken, including improved colour and texture, when 20 to 40 per cent of the wheat flour in the coating is substituted for de-flavoured red lentil flour. Other benefits include reduced cooking time and the

removal of potential allergens. The study also demonstrated similar preliminary results for battered fried fish and coated potato products.

PRK shared the results of this study with the foodservice industry by contributing to a white paper outlining the benefits of the de-flavoured coating, helping SPG achieve its goals of driving innovation and supporting the production of pulse crops in Canada.

**DID YOU KNOW?** Lentil flour is produced by grinding or milling lentils into a fine powder. Lentil flour can be de-flavoured using a heat treatment to remove some slight off flavours, or it can be used in its raw, untreated state.

Read the white paper:





# Client Projects

# 3

From the start, Prairie Research Kitchen (PRK) has worked to meet two objectives. The first is to work with industry to solve innovation challenges and increase the economic opportunities and prosperity of the companies we work with. The second is to engage students and instructors on industry-initiated applied research projects that enhance their knowledge and experience within an ever-changing industry landscape.

This section outlines the variety of ways PRK's Culinary Research team has engaged over the past eight years with Western Canadian companies, particularly small and medium enterprises (SMEs), to fulfill these objectives. Each story presented here demonstrates how our team used the knowledge and technology available in our labs to meet a client's vision. In some cases, new prototypes were created and commercialized. In others, the client sought our help in seeking out new applications for an existing ingredient to enhance the consumer experience and meet new market demands.

The complexity of these projects is as varied as the products we develop or work with. Most projects engaged students in research and recipe development; many of these students had never developed a prototype or recipe from scratch, nor had they used such unique ingredients before.

Early on, we added a student-led recipe development program to bridge academic learning objectives with the needs of our industry partners, who frequently seek ways to showcase their products in consumer or food service-friendly recipes. Developing recipes or formulations is often the first step in prototyping, although the complexity differs from product to product.

These recipe development projects have provided unique opportunities for students in RRC Polytech's School of Hospitality and Culinary Arts programs to gain experience in a functioning research kitchen, where they learn how to convert and standardize their recipes, read and create spreadsheets, and use



nutrition and formulation software to understand the nutritional profiles of the foods they create. Students are also taught how to apply research principles to the recipe development process. At the final stage of each project, RRC Polytech photography students are brought in to hone their skills in the challenging discipline of food and product photography.

Many of the projects featured in this section benefited from the support of the National Research Council's Industrial Research Assistance Program (NRC IRAP), which helps SMEs move through the innovation continuum from research and development to commercialization.

All recipes featured in this section have been approved for publication by the companies they were developed for.

# Engage-ing with Industry

Grant funding is the secret sauce that brings so much of our work to life. The former NSERC Engage grant and the current NSERC Applied Research and Development (ARD) grants, for example, are important funding tools for companies - especially small and medium enterprises. They encourage companies to engage students and staff at colleges across Canada, helping train the next generation of food product developers.

Prior to receiving the NSERC Innovation Enhancement (IE) grant that supported our early capacity-building projects, we received funding from NSERC Engage in 2014 that launched RRC Culinary Research's first collaboration with industry: a project with Granny's Poultry Cooperative.

Granny's Poultry worked closely with RRC Polytech chefs and students on the final phase of development for two new products: Cornbread Stuffed Turkey and an Unstuffed Slow Cooker Turkey Roast. Both products are naturally gluten-free and can be cooked straight from the freezer without thawing - the first of their kind to hit the market.

After working with our Culinary Research students and staff to test both products, Granny's fine-tuned their formula and cooking methods, ultimately securing a partnership with a major retailer that carries the products in over 100 stores across the Prairies.

The now-inactive NSERC Engage initiative contributed a maximum of \$25,000 to these research projects, augmented with in-kind contributions and cash from the partnering company. Additional NSERC Engage funding helped us take on several large projects, including a collaboration with Hemp Oil Canada (which later merged with Manitoba Harvest Hemp Foods, which was later purchased by Tilray).

This project developed student-led hemp oil prototypes under the guidance of chef instructor Gordon Bailey. Although hemp seeds, flour and protein products have come to dominate the hemp market, the oil extracted during processing contains valuable polyunsaturated fatty acids (PUFAs) that are important for human and animal health. Despite its healthy reputation, hemp oil is not widely used in food service.

Hemp Oil Canada partnered with us to create new, healthy oil-based products for mainstream consumers that overcome major challenges, including hemp oil's colour, strong flavour, and vulnerability to rapid oxidation.

Combining science and creativity, our team did just that, presenting recipes ready for test marketing and scale-up. The recipes we developed were based off popular dressings and dips typically made with other vegetable oils. Our goal was to maximize the hemp oil in each recipe as much as possible. We also conducted consumer trials for our recipes, which met with a positive response.



# Hemp Oil Mayo Base

YIELD: 9 CUPS

6 egg yolks  
2 tbsp Dijon mustard  
1350 ml hemp oil  
4 tbsp white wine vinegar  
3 tbsp lemon juice  
Salt and pepper to taste

1. Separate large eggs and reserve yolks in a large mixing bowl.
2. Add the Dijon mustard and vinegar. Whisk to incorporate.
3. Slowly add the hemp oil until the mixture reaches a thick, creamy consistency.
4. Add the lemon juice and season to taste with salt and pepper.

**NOTE** This base can be used in a variety of applications by adding different ingredients.

# Hemp Caesar Dressing

YIELD: 2 CUPS

2 egg yolks  
1 tbsp Dijon mustard  
1 cup hemp oil  
3 small anchovy fillets  
1/2 cup olive oil  
3 cloves garlic, crushed into paste  
Juice from 1 lemon  
2 tbsp white balsamic vinegar  
1/3 cup parmesan cheese, grated fine  
Salt and pepper to taste

1. In a food processor, combine the egg yolks, Dijon mustard, vinegar, garlic, and anchovies. Blend until smooth.
2. With the food processor on, slowly add the olive oil first, then the hemp oil.
3. Once you achieve a smooth, thick consistency, add the cheese, lemon juice, salt, and pepper.



# Maple Lemon Cashew Dressing

YIELD: 1 1/2 CUPS

1 cup hemp oil mayo base  
1/4 cup maple syrup  
1/4 cup lemon juice  
1 tbsp Dijon mustard  
1 tbsp shallots, minced  
1/2 cup cashews, minced  
Salt and pepper to taste

Combine all ingredients together.

**NOTE** This dressing doesn't separate but needs to be stirred before serving.

# Hemp Tartar Sauce

YIELD: 1 1/2 CUPS

1 cup hemp mayo  
1/2 cup dill pickle, small dice  
3 tbsp green onion, thinly sliced  
1 tbsp capers, chopped fine  
3 tbsp parsley, chopped  
1 tsp dried dill  
2 tsp lemon juice, fresh  
1 tsp Dijon mustard  
1/2 tsp dried tarragon  
1/2 tsp Worcestershire sauce  
1/4 tsp hot pepper sauce  
Salt and pepper to taste

1. Infuse the dill into the lemon juice. Bring to a simmer and turn off the heat, then let sit for 5 minutes.
2. Combine all ingredients in a bowl.
3. Refrigerate for at least 1 hour.

# Split Pea Hummus

YIELD: 4-6 PORTIONS

1 cup yellow split peas  
2 cloves garlic, chopped  
1 tbsp turmeric  
1 tsp cumin  
1/2 tsp paprika  
1/2 cup hemp oil  
Lemon juice to taste  
Salt and pepper to taste

1. Cook the split peas in simmering water until tender, reserve 1/4 cup of the cooking liquid.
2. Transfer the peas to a blender with the reserved liquid. Pulse the blender until the mixture is coarse.
3. Add the remaining ingredients and blend until smooth.
4. Season with salt, pepper, and lemon juice.

# Prairie Fava

In 2016, a small Manitoba start-up called Prairie Fava approached Prairie Research Kitchen to unlock the potential of the fava bean as a healthy food ingredient.

Hailey Jeffries founded Prairie Fava in 2015 after searching for alternative protein sources for her mother, who was undergoing cancer treatment. Fava beans grew on the family seed farm run by Hailey's husband Cale, but the market was limited. Hailey, a self-described "entrepreneurial spirit", soon realized fava could be used as a healthy ingredient in foods people already knew and loved.

Hailey began milling fava flour and flakes. She knew fava could enhance fibre and protein content in a wide range of recipes. Because their amino acid profiles are complimentary, fava flour can also combine with grain flours to create a complete protein source.

Processing beans is one thing, but developing fava flour into food products with broad market appeal is another, and Prairie Fava had little capacity for research and development.

Enter Prairie Research Kitchen.

Working with RRC Polytech's culinary team enabled Hailey to take the crucial next step of conducting basic research and developing recipes that build on the fava bean's greatest strengths, while working around the absence of gluten typically important for dough structure.

One of our first collaborations was a fava flour crouton. Fava-infused muffin and cookie recipes followed. Blind taste tests with family members delivered the good news to Hailey: everyone picked the goodies with 50 per cent fava as their favourite.

Prairie Fava has now blossomed into an award-winning company. It received the Manitoba Chambers of Commerce's Start-Up of the Year Award in 2019 and continues to meet a rising demand for its fava-based ingredients and products.

Prairie Research Kitchen was instrumental in the company's growth, says Hailey. "Having input from an applied research team provided me with valuable insights and direction that could only come from a place where culinary and food sciences are combined."

**FUN FACTS** The fava bean, also known as the faba bean, horse bean, field bean and broad bean, is a species of *vetch*, a flowering plant in the pea and bean family *Fabaceae*.

In France, the fava bean was once part of a tradition in which the *fève* (dried fava) is placed in a cake called *galette des rois*. Whoever found the *fève* became king or queen of the meal - which often meant they were expected to serve the other guests. Today's version of this tradition often involves a small metal or China trinket instead of a bean.



# Spaetzle

YIELD: 5 PORTIONS

2 cups	fava flour
4	eggs, lightly beaten
1/2 tbsp	salt
1/2 cup	water

**NOTES** This recipe works well as a side dish to pork schnitzel and braised cabbage. Adding herbs such as thyme, rosemary or lemongrass brings a freshness and beautiful flavour to this dish.

1. Put a large pot of salted water over high heat and bring to a boil. Lower the heat to a simmer.
2. In a mixing bowl, mix together all ingredients to form a batter.
3. Using a flat cheese grater, press the batter through the holes to extrude the spaetzle straight into the simmering water.
4. In a separate large bowl, prepare an ice bath. Once the spaetzle has floated to the surface of the hot water (about 1-2 minutes), scoop it out with a slotted spoon or mesh strainer into the cold ice bath. Once chilled, drain and transfer the spaetzle to a new bowl.
5. Heat a large sauté pan over medium-high heat. Add 1 tbsp of butter to the hot pan. Add half the chilled spaetzle and sauté until golden brown. Season to taste.
6. Repeat the sauté process with the remaining spaetzle.

Serve immediately.





# Fava Tortillas

YIELD: 15 TORTILLAS (7.5 PORTIONS)

1 cup	potato starch (not the same as potato flour)
1 cup + 2 tbsp	fava flour
1 tsp	xanthan gum
1/4 tsp	salt
1/4 cup	canola oil
1/2 tsp	baking powder
2/3 cup	water

**NOTE** These tortillas can be used for many applications, such as quesadillas, tacos, and fajitas.

1. In a stand mixer fitted with a dough hook attachment, add all the ingredients.
2. Starting on low speed, mix for 1 minute. Turn the speed up to medium and mix for another 2-3 minutes until the dough is well-combined. The texture should be soft and pliable but not sticky.
3. Remove the dough from the mixing bowl and wrap it in plastic wrap. Let it rest for 15-20 minutes.
4. Portion out 2 tbsp (40 g) of dough and roll it into a ball. Sandwich the dough ball between two pieces of parchment and, using a rolling pin, roll it into an 8" round. It should be thin enough to see your hand through the tortilla.
5. Heat a large non-stick pan on medium-high. Once the pan is hot, place the tortilla on the pan. Small bubbles should start to form in the tortilla almost immediately. Cook for about 2 minutes per side until the edges are slightly crispy and the bubbles start to turn dark brown.
6. Remove the tortilla from the pan and cover immediately with a dry, clean towel to keep it warm and soft.
7. Repeat with remainder of the dough.

# Spicy Fried Chicken

YIELD: 4 PORTIONS

## BRINE

4 chicken legs  
4 chicken thighs  
4 cups buttermilk  
1/4 cup Sriracha hot sauce  
1 1/2 tsp sea salt

## DREDGE

2 cups fava flour  
2 tsp paprika  
1/2 tsp cayenne pepper  
1/2 tsp pepper

## Brine

1. Clean the chicken pieces and place them in a large plastic container.
2. In a separate bowl, whisk together the buttermilk, Sriracha, and sea salt.
3. Pour the brine over the chicken, making sure all pieces are covered.
4. Place the chicken into the fridge and marinate for 24 hours.

## Dredge

1. Mix all the dredge ingredients in a large bowl.
2. Take the chicken out of the brine and move it to a separate bowl.
3. Using one piece of chicken at a time, place the chicken into the dredge and coat it evenly, then move the piece back into the brine, making sure the coating is fully saturated. Then coat the piece once more with the dredge and place it on a sheet pan lined with parchment paper. Repeat for all other pieces of chicken.
4. In a large pot, heat the oil to 300°F, then slowly drop the chicken pieces into the oil, making sure not to overcrowd the pot. Cook the chicken for 7-8 minutes or until an internal temperature of 165°F is achieved.
5. Once the chicken is cooked, place it on a wire rack to cool.





# Juno Food Labs

As our global population continues to grow, so does consumer demand for meat. According to the World Resources Institute, there will be three billion more mouths to feed in 2050 than in 2010. The problem is, the earth is running out of space to raise enough animals and grow the feed crops to sustain them.

That challenge is what motivated James Battershill to develop a hybrid meat that combines plant and animal protein. His goal was to create meat that takes fewer resources to produce, has a low environmental impact, and maintains the flavour and quality consumers expect from animal-based proteins. Blended products like these signal another step forward in helping consumers - and the meat industry - reduce their environmental footprint.

Initial trials showed that the concept was viable, but James needed some culinary and food science expertise on his team to take this novel idea from his own kitchen counter to grocery store shelves. Enter Prairie Research Kitchen.

An initial two-year project with PRK encompassed ingredient selection, hydration, and ratio refinement - a surprisingly complex process, owing to the variety of ingredient and processing options. James and PRK's culinary researchers eventually decided that pea-based plant proteins worked best, thanks to pea's ability to hold taste and texture throughout the cooking process. The final formulation they arrived at for Bump Beef + Plant Blend, the first-ever plant-enhanced ground beef, was 70 per cent beef to 30 per cent pea protein.

The PRK team then conducted a thorough series of production tests and sensory trials. Students developed four recipes to test Bump's performance and functionality, including the three we share here, and Anna Borys's kebab recipe on page 115.

James says working with the PRK's culinary research team "took the product from an idea to something that was refined and ready for commercialization."

Bump Beef + Plant Blend has proven a success from the test kitchen to the research kitchen and beyond. James and Juno Food Labs continue to introduce Bump to new retailers and develop new products, including burger patties and several varieties of plant-enhanced pork sausage.



# Dan Dan Noodle Bowl

YIELD: 6 PORTIONS

## CHILI OIL (YIELDS 1/2 CUP)

1/2 cup	canola oil
1 stick	cinnamon
5 pieces	star anise, whole
2 tsp	chili flakes, crushed
1/2 tsp	dried Szechuan peppers

## SAUCE (YIELDS 2 CUPS)

4 tsp	smooth peanut butter
1/2 cup	sweetened black rice vinegar (rice vinegar can be substituted)
4 tbsp	soy sauce
4 tsp	tahini
4 tsp	five spice powder
5 tbsp	ginger, grated
1 cup	cilantro, rough chopped
1/2 cup	Dan Dan Chili Oil (see above)

## NOODLE BOWL

1 pkg (454 g)	Bump Ground Beef + Plant Protein Blend
2/3 cup	onions, small dice
2 tbsp	garlic, minced
4 tsp	soy sauce
4 tsp	canola oil
2 cups	Dan Dan Sauce (see above)
1 pkg (400 g dry)	somen noodles

**FUN FACT** *Dan Dan* is a Chinese Szechuan noodle dish with a spicy sauce. The name refers to the pole (“dan dan”) street vendors carried over their shoulder with a basket at either end containing the noodles and sauce.

## Chili oil

1. Over medium-high heat, add the cinnamon stick and star anise in a small pan and heat until fragrant.
2. Remove from heat and add the canola oil, crushed chili flakes, and dried Szechuan peppers. Set aside to steep for 5-10 minutes.

## Sauce

1. Place all the ingredients in a stainless-steel bowl and whisk until combined. Set aside until needed.

## Assembly

2. Boil water and par-cook the somen noodles for 3 minutes. Drain, rinse briefly under cold water, and set aside until needed.
3. In a stainless-steel sauté pan, heat the canola oil over medium-high heat.
4. Add the Bump to a hot pan. Using a wooden spoon or spatula, break apart the Bump and sear it until it's evenly browned and starts to get crispy on the bottom of pan.
5. Add the onions and garlic. Cook until fragrant. Add 1 tbsp of water to help release the crispy bits from the bottom of the pan.
6. Add the Dan Dan Sauce and mix until evenly distributed throughout the meat. Add the additional soy sauce to taste, if desired.
7. Lower the heat and add the partially cooked somen noodles. Mix until the noodles are evenly coated with the sauce and fully cooked through.



# Biscuits and Bump

YIELD: 8 SERVINGS

## STEW

2 tsp	canola oil, divided
1 pkg	Bump Ground Beef + Plant Protein Blend
1 1/2 tsp	table salt, divided
2 cups or 1 large	onion, small dice
1 1/2 cups or 1 large	carrots, small dice
1 1/2 cups or 4 large	ribs celery, small dice
3 cups	mushrooms, sliced
1 1/2 tbsp or 5-6	cloves garlic, minced
1/2 cup	parsley, chopped
1/2 tsp	black pepper, ground
2 tbsp	tomato paste
1/4 cup + 2 tbsp	all-purpose flour
2 tsp	paprika, ground
900 ml	beef or vegetable stock, no sodium

1	bay leaf, dry
1/2 cup	heavy cream
1 1/2 cups	peas, frozen
2 tsp	Tabasco sauce
2 tsp	Worcestershire sauce

## BISCUITS

2 cups	all-purpose flour
1 tbsp	baking powder
1/2 tsp	salt
1 tsp	sugar, white granulated
1/2 cup	unsalted butter, melted
1 cup	2% milk
1 1/4 cup	cheddar cheese, grated
1/3 cup	green onions, chopped

## Stew

1. Heat 1 tsp of canola oil in a large sauce pan over medium-high heat.
2. Add Bump and, using a spatula or wooden spoon, break it apart into small pea-sized chunks. Add 1 tsp of salt. Brown the Bump evenly until it just starts to stick to the bottom of the pan.
3. Remove the Bump from the pan and set it aside in a small bowl.
4. Heat the remainder of the oil in the same pan over medium heat. Add the onions and 1-2 tbsps of water and stir to help release the bits that are stuck to the bottom of the pan.
5. Once the onions are slightly tender, add the mushrooms, carrots, celery, garlic, and the remainder of salt and black pepper. Cook until tender, about 8 minutes.
6. Add the tomato paste and paprika and stir until completely combined. Cook for 1 minute.
7. Sprinkle the flour over and stir to combine. The mixture will become quite thick and almost paste-like as the flour thickens. Cook for 3 minutes.
8. Slowly add the stock about 1/2 cup at a time while stirring constantly and scraping the bottom of the pan, only adding more stock once the last addition has been incorporated. Once the stock has been fully added, turn the heat to low and bring to a simmer.
9. Stir in the cooked Bump and add the bay leaf. Simmer for 5 minutes.
10. Stir in the cream, peas, parsley, Tabasco (to desired spiciness) and Worcestershire.

11. Bring to a low simmer, and cover while you prepare the biscuit dough.

## Biscuits

1. In a large mixing bowl, combine all the dry ingredients, cheese, and onion.
2. In a separate bowl, whisk together the milk and melted butter and add to the dry ingredients.
3. Stir until just combined and forms a shaggy dough.

## Assembly

1. Heat the oven to 450°F. Ladle the warm Bump stew mixture into a 9x13 baking dish.
2. Scoop the biscuit dough on top of the Bump mixture in 2-3 tbsp sized portions, in three rows of five, leaving space between biscuits. You should have leftover dough.
3. Scoop the remaining dough onto a parchment-lined sheet pan.
4. Bake the casserole for about 15-18 minutes until the biscuits are golden on top, and the extra biscuits for 10-12 minutes until golden brown.
5. Allow to rest 10-15 minutes before serving.

**NOTES** The spare biscuits are great for mopping up the bottom of your bowl, or to have separately for leftovers! For a quicker version, substitute fresh for frozen veggies, skip stew steps 3-5, and add them during step 9. Adjust seasoning as required.



# Siu Mai (Dumplings)

YIELD: 44 DUMPLINGS

44 pieces	wonton wrappers
1 pack (454 g)	Bump Ground Beef + Plant Protein Blend
1/2 cup	carrots, grated
2/3 cup	white onions, small dice
2 tsp	sea salt
1/4 tsp	black pepper, ground
1/2 cup	canned water chestnuts, drained and roughly chopped
2 tbsp	garlic, minced
1	egg, beaten
2 tbsp	ginger, grated
2 tbsp	cornstarch
2/3 cup	cilantro, chopped
2 tbsp	soy sauce
2 tbsp	lime juice
1 1/2 tbsp	lime zest

**NOTES** Best served with sweet chili oil. Store uncooked in a sealed container in the freezer for up to 3 months. Steaming may take longer if cooking from frozen. Make sure the internal temperature reads 165°F.

**FUN FACT** *Siu mai* is a traditional Chinese dumpling. It has many variations in China and beyond, including countries such as Japan, Indonesia, the Philippines, and Vietnam. According to historians, it was originally served as a snack with tea.

1. In a stainless-steel bowl, mix all the ingredients except the wonton wrappers until evenly distributed.
2. Heat approximately 1" of water in a large pot fitted with a steamer basket, and cover with a lid so it gets to a boil while you prepare your dumplings.
3. Line the steamer basket with parchment paper.
4. Working with one dumpling wrapper at a time, spoon about 1 tbsp of the filling into the centre.
5. Using your finger, moisten the edges of the dumpling wrapper with water.
6. Bring all four corners up to meet at the centre. Use your fingers to seal all edges.
7. Place the dumpling in the prepared steamer basket. Repeat until all the dumplings are filled and sealed.
8. Arrange the siu mai dumplings in a single layer, about 1/2" apart in a steamer basket, and cook for 12 minutes.

Serve immediately.



# GroundUp eco-ventures

The push for a more sustainable future has added urgency to dealing with byproducts in the food industry. Some of our work, including this project conducted in partnership with GroundUp eco-ventures, explores ways to recover and repurpose waste into new ingredients.

GroundUp is an Alberta-based start-up that upcycles leftover materials from the food production process and repurposes them as flour. The company's owner, Shawn Leggett, enlisted Prairie Research Kitchen to support the development of an eco-friendly, locally sourced, high protein, instant pancake mix made with brewer's spent grain (BSG) and a brownie mix made with recycled coffee grounds.

Because they contain little or no gluten and high fibre, neither ingredient can function as a traditional wheat flour. Gluten is often what forms the structure of a baked good, and without it, we were challenged with finding other ingredients to do the work.

Following weeks of trials, PRK culinary research assistant Anna Borys overcame the project's main challenge of improving the texture that comes with high-fibre material. Her analysis of the trials and multiple ingredient combinations led to a formulation that improved the functionality of BSG flour. From there, the entire PRK team worked with GroundUp on tasting trials.

Then, after producing dozens of samples of each baking mix and testing many batches of pancakes, waffles, and brownies, PRK produced a refined recipe and optimal cooking procedure, as well as feedback and recommendations for future products. The combination we developed led GroundUp to launch its ready-to-mix packages alongside its individual flours.

GroundUp's Born Again Protein Brownies were named the grand prize winner at the 2022 Made in Alberta Awards given by the Alberta Food Processors Association. GroundUp's Better Breakfast High-Protein Pancake Mix and brownie mix also won gold for innovation of the year at the 2022 SIAL Canada trade show in Montreal.

"It's mind-blowing how quickly our upcycling concept was transformed into an award-winning product after we tapped into the incredible resources at Prairie Research Kitchen," says Leggett. "Combining their technical knowledge with our passion and energy allowed the team to perfect our idea through refinement trials that have resulted in us shattering all projections."

Although the brownie and waffle mixes are ready to eat, we couldn't resist creating a crêpe with the existing mix for this book and adding some pizzazz to the toppings.



“It’s mind blowing how quickly our upcycling concept was transformed into an award-winning product after we tapped into the incredible resources at Prairie Research Kitchen.”

SHAWN LEGGETT

# Spent Grain Crêpes

YIELD: 6-8 CRÊPES

1 cup	Better Breakfast High Protein Pancake mix, ground up
1 1/2 cups	water
1	egg
2 tbsps	unsalted butter, melted

## OPTIONAL TOPPINGS

Peanut butter  
Marshmallow fluff  
Bananas, sliced  
Chocolate chips  
Cured salmon  
Cream cheese  
Capers  
Dill

1. Whisk together the water, eggs, and melted butter.
2. Add in the dry pancake mix and whisk until there are no clumps and the mixture is smooth. (Don't worry about over-mixing).
3. Heat a small (8") non-stick frying pan over low-medium heat. Once hot, turn the heat to low. Lightly coat the pan with pan spray.
4. Scoop 1/4 cup of batter into the middle of the pan and swirl in a circular pattern to distribute the batter thinly and evenly over the bottom of the pan.
5. Allow the batter to cook for about 3 minutes or until you see bubbles forming along the surface and the edges gently start to pull away from the edge of the pan.
6. Using your fingertips, swiftly grab the back edge of the crêpe, and in one motion, flip to the other side to continue cooking until done, about 30 seconds.
7. After cooking, slide the crêpe onto a paper towel-lined plate, and lightly cover with a clean tea towel so it doesn't dry out.
8. Repeat with the remaining batter.





# Big Mountain Foods

The Prairie Research Kitchen team has played a pivotal role in developing new products with Big Mountain Foods, an award-winning innovator of plant-based consumer packaged foods.

Big Mountain first turned to PRK in 2020 to conduct product and process validation work on a challenging new manufacturing process. We evolved into Big Mountain's product development partner as the company began exploring ways to create a variety of plant-based products over the next two years.

PRK's work with Big Mountain built on our research in developing value-added food platform technology using Manitoba-grown plant proteins. This work was an outgrowth of the Prairie Plant Protein Project (see page 38) and led us to create a variety of tofu platforms and protein extraction methods, as well as value-added applications for the co-products of tofu production.

Another key partner on this project was Prairie Fava (see page 59), which served as an ingredient supplier facilitated by a Protein Industries Canada (PIC) partnership project. Much of the product development work we conducted with Prairie Fava is now being channeled into the creation of new consumer products through Big Mountain, such as a line of innovative fava-based food products, including non-allergen tofu.

Currently, most plant-based foods are made using soy, wheat, and yellow or green peas. However, as the market for plant-based proteins continues to grow, consumers are demanding a wider range of plant-based food products. The collaboration with Prairie Fava will incorporate low vicine and co-vicine (LVLCV) fava varieties into Big Mountain's line of consumer-packaged goods and food service products. These products will fulfill the request of several leading Canadian food manufacturers and food service providers.

Big Mountain Foods will also produce fava-based products at the world's first allergen- and soy-free tofu factory. This allergen-free tofu is superior in protein content to soy tofu, but has the same taste, colour, functionality, and texture as traditional tofu.

Currently, most plant-based foods are made using soy, wheat, and yellow or green peas. However, as the market for plant-based proteins continues to grow, consumers are demanding a wider range of plant-based food products.

**TAC INTERACTIVE VISITS** Thanks to the Tech-Access Canada Interactive Visits program, one of our researchers was able to travel to Big Mountain's production plant to help the company work through production challenges. Many of our clients tap into this program to engage on site with our researcher expertise and help get their products, processes and services market-ready.

# Larb

YIELD: SIXTEEN 30 ML SERVINGS IN LETTUCE CUPS

2/3 package smoked tofu, small dice  
1/2 onion, small dice  
1/4 cup cilantro, minced  
1/4 cup mint, finely sliced  
1 lime juice and zest  
2 tbsp lemon grass, finely sliced  
1 garlic clove, minced  
1 Thai chili, finely sliced  
1/2 tsp kosher salt  
2 tbsp vegan oyster sauce  
1 tsp white pepper  
1/4 cup canola oil  
1/2 tsp sugar

1. In a food processor, add the smoked tofu and pulse 5 times, creating a crumbly texture.
2. In a medium non-stick pan, heat the oil over a medium heat.
3. Add the onions, garlic, and Thai chili and sauté for 30 seconds to warm up the ingredients.
4. Add the white pepper, salt, sugar, oyster sauce, lime juice, and zest. Mix for 30 seconds. Add the tofu and continue to sauté for 30 seconds.
5. Remove from heat into a serving bowl.
6. Add the fresh mint and cilantro and toss to mix.

Serve with lettuce cups or hot rice.

**NOTE** Keeping the mint and cilantro whole will improve the larb's visual appearance.



# Tofu Musubi

YIELD: 6 MUSUBI

1 package	smoked tofu, cut into quarter-inch steaks
2 tbsp	mirin
1 tbsp	brown sugar
4 tbsp	soy-free soy sauce
1 tsp + 1 tsp	kosher salt
2	nori sheets, cut into quarters
1 tbsp	canola oil

## SUSHI RICE

1 cup	short grain rice
1 1/4 cups	water
1/2 cup	rice vinegar
1/2 tsp	kosher salt
2 tbsp	sugar

1. In a mixing bowl, add the mirin, soy sauce and 1 tsp salt. Whisk to combine.
2. Add the smoked tofu to a mixing bowl and mix to coat with marinade.
3. Place the tofu and marinade in a resealable bag. Marinate for 2 hours.
4. Prepare sushi rice (see below).
5. Remove the tofu from the resealable bag, reserving the marinade. Season the tofu with the remaining 1 tsp salt.
6. Prepare a parchment-lined sheet pan.
7. In a frying pan, heat the oil over high heat. Add the tofu and fry each side for 3 minutes or until browned.
8. Lower the heat to medium-low and add the marinade and brown sugar. Stir with a spatula and glaze the tofu.
9. Remove from heat and place the tofu on the prepared sheet pan.
10. Place the sushi rice in a rectangular mold, creating a quarter-inch layer. Layer the fried tofu on top.
11. Invert the layered rice and tofu out of the mold and wrap with the nori.

Serve.

## Sushi rice

1. Pour the water and rice into a small pot and bring to a boil over high heat.
2. Reduce to a medium low heat, cover and simmer for 20 minutes. While the rice is cooking, prepare the rice seasoning.
3. In a small pot, add the rice vinegar, kosher salt, and sugar. Heat over low heat just until the sugar has dissolved. Remove from the heat and set aside.
4. Place the sushi rice in a mixing bowl.
5. Using a rice paddle or spatula, slowly add the rice vinegar mixture to the rice and stir.
6. Cover with a kitchen towel and set aside.

**NOTE** If possible, use a rice cooker to cook the rice.

# Richardson Food & Ingredients

Big companies like Richardson International are key partners in culinary research. As industry leaders, they keep our students and staff engaged on the cutting edge, where consumer trends and technological advances are shaping the future of food. As employers, they hire our students when they graduate.

But Richardson International isn't just any big company: it's Canada's largest agribusiness, with over 3,000 employees working at 100 locations around the world - including right here in Manitoba, home to the company's head office. Richardson's Manitoba connections run deep. The company is a subsidiary of James Richardson & Sons, Limited, the first company to handle grain grown by farmers in Western Canada and the first to build grain elevators in many communities across our province.

Richardson Food & Ingredients, a division of Richardson International, turned to us in 2021 to augment their research teams and train a new line of product developers from RRC Polytech's culinary programs. While still rare for us, this kind of partnership is becoming more frequent as large multinational enterprises continue hiring culinary-trained product developers.

For this partnership, Prairie Research Kitchen created student-led recipe development projects that two of our students - Michael Luay and Veronica Camannong - undertook as a first step in their product development training. They were tasked with producing recipes or base formulations using Richardson products and ingredients, including Wesson Oil, the third-largest oil brand in the US.

By the end of projects like these, we want students to demonstrate an ability to:

- Understand the client's needs, including dietary restrictions and expected timeline
- Brainstorm innovative and delicious recipe ideas, often based on current food trends and ethnic cuisines, or employing new techniques
- Communicate professionally with the client
- Develop, test, and finalize recipes, standardize them by weight and volumetric conventions, and adjust the recipe to suit at-home users
- Document each trial through photography and written observations
- Learn the importance of scientific measurement
- Prepare, plate, and photograph the final dish
- Calculate and create a Nutritional Facts table
- Write the final recipe card and contribute to the final report

We look forward to working with Western Canada's large manufacturers to augment their research teams and train the next generation of culinary-trained product developers.



# Cinnamon Toast Pancakes with Cereal Milk Whipping Cream

YIELD: 10 PANCAKES (1/4 CUP OF BATTER FOR EACH PANCAKE)

## CINNAMON TOAST BLEND

2 cups graham crumbs  
4 tbsp sugar  
4 tsp cinnamon  
1 cup margarine, melted

## CEREAL WHIPPING CREAM

1 cup whipping cream  
1/2 cup cinnamon toast blend

## CEREAL MILK

1/2 cup cinnamon toast blend  
2 cups 2% milk

## CINNAMON TOAST PANCAKES

1 1/2 cups all-purpose flour  
1 tbsp baking powder  
1/4 tsp kosher salt  
1 tbsp sugar  
1 1/4 cups cereal milk  
1 egg  
3 tbsp canola oil

## Cinnamon toast blend

1. Preheat the oven to 350°F.
2. Combine all ingredients in a mixing bowl and mix with a rubber spatula.
3. Place all ingredients on a parchment lined sheet pan and toast in the oven for 20 minutes.
4. Let cool on the sheet pan, then store in an airtight container.

## Cereal whipping cream

1. In a measuring cup, combine the whipping cream and cinnamon toast blend.
2. Let steep for 15 minutes, then strain into a mixing bowl.
3. Whisk until stiff peaks form.

## Cereal milk

1. In a measuring cup, combine the milk and cinnamon toast blend. Let steep for 15 minutes.
2. Strain the mixture, reserving the cereal milk.

## Cinnamon toast pancakes

1. Place the cereal milk, oil, and egg in a mixing bowl and whisk to combine.
2. Add the rest of the ingredients and mix with a rubber spatula just until you cannot see any dry ingredients.
3. Heat a frying pan on low until warm. Place 2 tbsp of oil in the pan.
4. Once the oil is heated, place 1/4 cup of the pancake batter in the pan and cook for 3 minutes. Flip the pancake and cook for another 3 minutes. Repeat until you have no more pancake batter.

Serve with the cereal whipping cream and cinnamon toast blend for the topping. You can add maple syrup, but the pancakes are sweet on their own.

# Black Forest Cupcakes

YIELD: 12 CUPCAKES

## CUPCAKES

1/4 cup	Wesson canola oil
3 oz	bittersweet chocolate, finely chopped
1/4 cup + 1 tbsp + 1 tsp	cocoa powder, unsweetened
1/4 cup	water, hot
3/4 cup	all-purpose flour
3/4 cup	white sugar
1/2 tsp	salt
1/2 tsp	baking soda
2 cartons	eggs, large
2 tsp	white vinegar
1/2 tbsp	vanilla extract

## CHERRY FILLING

8 tbsp	white sugar
1/2 tbsp	cornstarch
3 tbsp	lemon juice
2 cups	cherries, frozen, pitted

## WHITE CHOCOLATE GANACHE

2 cups	35% cream
3/4 cup	white chocolate

## Cupcakes

1. Preheat the oven to 350°F. Place the chocolate in a bowl and pour in the hot water. Let sit for 1 minute and whisk until smooth. Set aside to cool.
2. In a large bowl, sift the flour, sugar, cocoa powder, salt, and baking soda.
3. In a separate large bowl, whisk together the canola oil, eggs, vinegar, and vanilla. Pour the chocolate mixture into the oil mixture and stir until combined, then add the flour mixture and whisk until smooth.
4. Divide the batter into 12 paper-lined muffin cups. Fill 3/4 per cup. Cook for 17 minutes, until a skewer comes out clean. Let cool completely before cooking.

## Cherry filling

1. On medium-high heat, combine the sugar, cornstarch, and lemon juice in a small pot.
2. Heat until the sugar begins to melt.
3. Continue to cook until the cherries start to soften and let out juices.
4. Remove from the heat when the mixture begins to thicken. Pour the mixture into another bowl and refrigerate until cool.
5. Once cool, remove the centres from the cupcakes with a cupcake corer or knife.
6. Fill the centres with the cooled cherry filling.

## White chocolate ganache

1. In a small pot over low heat, add the cream. Using a food thermometer, heat the cream to 140°F (60°C).
2. Put the chocolate in a large bowl and pour in the heated cream. Let sit for 2 minutes.
3. Whisk the cream and chocolate together until fully combined.
4. Place the bowl with the chocolate mixture on top of an ice bath and whisk to cool quicker. Whisk until temperature reaches 40°F (4°C).
5. In a mixer bowl, add the chocolate and cream mixture. Mix on medium-high speed until stiff peaks form.
6. Transfer to a piping bag with a tip and pipe the whipped ganache on top of each cupcake.



# Grilled Chili Lime Shrimp Skewers with Mango Salsa

YIELD: 4 SERVINGS, 5 PIECES OF SHRIMP PER SKEWER, 2 SKEWERS PER SERVING

## SHRIMP MARINADE

1/4 cup	Wesson canola oil
1/2 cup	lime juice
1 tbsp + 1 tsp	garlic, fresh, minced
1 tsp	chili flakes
2 tsp	cumin
1 tsp	paprika
1 tbsp + 1 tsp	honey
1/4 cup	cilantro
1 tbsp + 1 tsp	jalapeño, minced
2 tsp	kosher salt
1 tsp	black pepper, ground
40 pieces	shrimp, peeled, de-veined, uncooked, tail on, 21+

## MANGO SALSA

2 cups	sweet mangos, sliced into small cubes
1 cup	green bell pepper, sliced into small cubes
1/4 cup	red onion, minced
1/4 cup	parsley, chopped
2 tbsp	cilantro, chopped
1/4 cup	lime juice
1 tsp	kosher salt
1/2 tsp	black pepper, ground

## Grilled shrimp

1. In a large bowl, combine the canola oil, lime juice, garlic, chili flakes, cumin, paprika, honey, cilantro, jalapeño, salt, and pepper. Whisk until properly combined.
2. Add the shrimp. Toss to coat. Cover and refrigerate. Let the shrimp marinade for 30 minutes to an hour.
3. Pre-heat a grill to medium-high heat.
4. Thread 5 pieces of shrimp per skewer. Grill for 3 minutes on each side. Scoop the marinade onto each side while cooking.

## Mango salsa

1. In a large bowl, combine the mangos, green bell pepper, red onion, parsley, cilantro, lime juice, salt, and pepper. Toss until evenly mixed. Cover and set aside.

Serve 2 shrimp skewers warm with a generous amount of mango salsa on the side.





# Ulivit

Small and medium food companies love working with Prairie Research Kitchen's student recipe development program because our collaboration delivers results that showcase their innovative products and creates social media and web content for their growing companies.

Ulivit (pronounced *you-live-it*) is a Saskatoon-based company specializing in developing sustainable, Canadian-grown, plant-based foods. Ulivit came to us with their chickpea tofu in 2020. Ulivit Plant Protein 2.0 is vegan, non-GMO, and free of soy, gluten, and nuts, with no artificial ingredients or preservatives.

Ulivit owners Laura and Carla Gustafson challenged our students to develop recipes that were vegan, delicious, easy to prepare, and functional - "dishes that improve happiness, ease anxiety, promote gut health, and fight disease." The recipes could not use soy, but some could include gluten, nuts, and sugar. They wanted at least one recipe containing a full protein (ie. all nine essential amino acids) and one with Middle Eastern spices that promote health and immunity, such as fenugreek/methi, garam masala, and cardamom.

The students involved in this project, Rajveer Kaur Brar and Roxanne Kent, rose to the occasion with five recipes, three of which we share in the following pages.

"The PRK team guided and worked with us to develop delicious recipes and photographs that we use on our website and Instagram," says Laura Gustafson. "We were super excited to partner with RRC Polytech and work with the innovative and trendsetting culinary chefs and students. We look forward to future projects with them!"





## Ulivit Plant Protein 2.0 Falafel

YIELD: 22 FALAFELS

1 package	Ulivit Plant Protein 2.0, grated
1 1/2 tsp	garlic, minced
1/2 tsp	salt
1/2 tsp	black pepper, ground
1/4 tsp	fenugreek, dry, ground
1/4 tsp	cardamom, ground
1/4 tsp	cinnamon, ground
1 tsp	cumin, ground
2 tbsp	parsley, finely chopped
2 tbsp	cilantro, finely chopped
1/2 cup	red onion, minced
1/2 cup	quick cooking oats

1. Preheat the oven to 450°F. Line a baking sheet with parchment paper and lightly grease it with vegetable oil.
2. Combine all spices in a large mixing bowl. Add the onion, garlic, parsley, cilantro, and quick oats. Mix until thoroughly combined.
3. Add the grated Ulivit Tofu Substitute to the mixture. Gently mix until combined and able to form ball. Do not overmix; Ulivit should still be slightly chunky and not like a paste.
4. Scoop 1 tbsp of the mixture and roll into a ball. Imperfections in the shape will get crispy and brown in the oven, so don't worry about rolling them into perfect spheres.
5. When all the mixture has been scooped and rolled, place the balls onto the baking sheet, spacing them evenly.
6. Place the baking sheet on the centre rack of the preheated oven.
7. Bake for 20-25 minutes, flipping the falafels once halfway through to ensure even browning.

# Methi Bhurji with Ulivit Plant Protein 2.0

YIELD: 4 SERVINGS

4 tbsp	canola oil
2 tsp	cumin seeds, whole
2 tsp	garlic, minced
2 tsp	ginger, peeled and minced
1 cup	onion, diced
1 tsp	turmeric, dry ground
1/2 tsp	garam masala, dry ground
1/2 tsp	salt
1/2 tsp	cayenne, dry ground
1 pkg	Ulivit Plant Protein 2.0, 1 1/2 cubes
3 cups or 1 bunch	fenugreek, fresh (or spinach or watercress)
1 cup	water

1. In a large non-stick pan over medium heat, heat the oil, add the cumin seeds and toast for 30 seconds until aromatic, being careful not to burn.
2. Add the minced garlic and ginger into the cumin and cook for another 1 minute, stirring constantly.
3. Add the onions and cook for another 2 minutes until soft and translucent.
4. Stir in the remaining spices and water. Simmer for 2-3 minutes over medium heat.
5. Stir in the fenugreek leaves and cook for 1 1/2 minutes until wilted.
6. Gently stir in the Ulivit soy-free tofu until it is well coated. Cover the pan and turn the heat to low; simmer for 2 minutes until heated through.

Garnish with cilantro and serve with basmati rice and naan.



# Summer Rolls with Tamarind Sauce

YIELD: 16 ROLLS WITH 1 1/2 CUPS SAUCE

## MARINADE

2 tsp sesame oil  
2 tsp rice vinegar  
1 tsp garlic, minced  
1 tbsp oregano, dry flakes  
1/2 tsp salt  
1/4 tsp black pepper, ground  
1 tsp sambal oelek or chili paste

## TAMARIND SAUCE

1/2 cup tamarind pulp  
1 1/2 cups water  
1/4 tsp cumin, dry ground  
1/4 tsp ginger, dry ground  
1/2 tsp sambal oelek or chili paste  
4 tsp sugar, white granulated  
1/4 tsp salt

## FILLING

1 large, long English cucumber, peeled, 2 1/2" matchsticks  
2 medium red pepper, 2 1/2" matchsticks  
1 medium carrot, peeled, 2 1/2" matchsticks  
1 pkg Ulivit Plant Protein 2.0, 2 1/2" matchsticks  
16 pcs rice paper rolls, 8"  
1/4 cup mint, slivered or chiffonaded

## Marinade

1. Whisk together all marinade ingredients until well combined.
2. Add the sliced Ulivit tofu to the marinade and toss to coat evenly.
3. Cover and refrigerate for at least 20 minutes.

## Tamarind sauce

1. In a small pot over medium heat, bring the tamarind pulp and water to a boil. (You can add a little more water if you prefer a looser sauce.) Allow to simmer for 4-5 minutes, stirring periodically to avoid burning. Remove from heat and allow to cool for 5 minutes.
2. Using a wooden spoon or potato masher, mash the tamarind into a paste.
3. Run the paste through a fine mesh strainer into a bowl; discard the pulp remaining in the strainer.
4. In a small bowl, combine all dry ingredients.
5. Return the strained paste into the pan and mix in the dry ingredients and sambal oelek. Bring to a simmer over medium heat and stir for 4-5 minutes. Remove the sauce from the pot and place in a small bowl.
6. Allow to cool, cover, then store in fridge until required.

## Summer roll assembly

1. Divide the veggies, mint and marinated Ulivit tofu into 16 equal bundles on a separate sheet pan so there's about 1/3 cup filling per bundle. Soak 1 round of rice paper at a time in warm water for 10-15 seconds until soft and pliable.
2. Place one bundle of vegetables and marinated Ulivit in the middle of the moist rice paper.
3. Carefully fold the bottom of the rice paper up and over the filling, fold in the sides, and continue to roll until the filling is tightly secure and the rice paper roll is sealed shut.
4. Cut in half on the bias.

Serve with sauce. Garnish with green onion.



# MSPrebiotic™

MSPrebiotic™ is a prebiotic resistant starch (RS2) from potatoes. Prebiotics are compounds in food that encourage the growth of beneficial microorganisms such as bacteria and fungi - especially those in our digestive tract.

Resistant starch is a prebiotic because it resists degradation during digestion until it reaches the colon, where it feeds the “good” bacteria living in our gut biome. It also acts as a fibre, resulting in better gut health without causing digestive upset or bloating. MSPrebiotic™ is the only supplement-grade resistant starch on the market. Its benefits are supported by over a decade of human clinical and scientific research.

The product development challenge with MSPrebiotic™ is that it cannot be heated above 60°C. At that temperature or higher, it loses its prebiotic properties. When the Manitoba-based company that produces MSPrebiotic™ approached us in 2018, our culinary research team was tasked with developing creative applications and recipes for home use, and potential prototypes that could be incorporated into consumer-ready products.

For the student leading the project, Chong (Terry) Yin, the goal was to devise recipes that included three to five grams per serving of MSPrebiotic™ Resistant Starch supplement.

As well, eight of the recipes had to be low in FODMAP ingredients and be suitable for people choosing to follow a low-FODMAP diet. FODMAP is the collective term for fermentable oligosaccharides, disaccharides, monosaccharides, and polyols - the short-chain carbohydrates and sugar alcohols found in foods and food additives. Low-FODMAP diets have been scientifically validated as effective dietary therapy for irritable bowel syndrome (IBS) and its symptoms.

Terry combined creativity with his own knowledge of ingredients and recipes from China to create 26 innovative recipes the company could use to promote the versatility and benefits of MSPrebiotic™ for better digestive health.



**DID YOU KNOW?** Over 10,000 years ago, ancestral diets were raw and rich in unripe fruits and vegetables, containing 30-50 g of resistant starch per day. Many processed foods lack fibre of all types, including resistant starch, which acts like a soluble fibre. Today, the average North American gets only 4 g or 20 per cent of the suggested amount of resistant starch from diet alone.

# RS2 Turmeric Ginger Milk

YIELD: 4 SERVINGS (200 G PER SERVING)  
(3.5 G OF MSPREBIOTIC™ RS2 PER SERVING)

1/2 tsp	turmeric powder
5 cups	2% milk
1	cinnamon stick
1 tbsp	fresh ginger, julienne
4 tsp	honey
4 tsp	MSPrebiotic™ RS2

**NOTE** This recipe has a beautiful yellow colour and flavour and is best prepared a day ahead.

1. Pour the milk into a sauce pot, then add the ginger, cinnamon stick, honey, and turmeric powder.
2. Heat the milk on medium-medium low. When it's just about to simmer, remove the milk and transfer it into a bowl. Do not boil the mixture, as it will separate. Heat lightly to extract the flavours.
3. Let the mixture sit in the fridge overnight or until cold.
4. Pour the mixture through a cheesecloth or fine strainer.
5. Mix in the MSPrebiotic™ and top with a few ice cubes. Garnish with ground cinnamon or shaved chocolate.

# RS2 Pesto

YIELD: 2 CUPS / 500 G  
(2.5 G OF MSPREBIOTIC™ RS2 PER SERVING)

4 cups	fresh basil leaves, packed (half can be baby spinach)
1 cup	parmesan cheese, grated
1 cup	extra virgin olive oil
2/3 cup	pine nuts
2 tbsp	garlic cloves, minced
2 tsp	salt
1 tsp	black pepper, ground
4 tbsp	MSPrebiotic™ RS2

1. Using a food processor, pulse the basil leaves and pine nuts several times.
2. Add the garlic, cheese, and MSPrebiotic™ RS2 and pulse several times more. Scrape down the sides with a rubber spatula.
3. While the food processor is running, slowly add the olive oil in a steady stream, which will allow the mixture to emulsify and not separate. Stop and scrape down the sides occasionally.
4. Season with salt and pepper to taste. Store in an airtight container in the fridge.



# RS2 Classic Hummus

YIELD: 2 CUPS / 525 G  
(5 G OF MSPREBIOTIC™  
RS2 PER SERVING)

2 cups	chickpeas, cooked, drained, and rinsed
1/4 cup	tahini paste
1/2 cup	water
2 cloves	garlic, crushed
Juice from 1 lemon	
1 tsp	cumin, ground
1 tsp	salt
1/2 tsp	pepper, ground
1/2 tsp	paprika
4 tbsp	MSPrebiotic™ RS2

1. Heat a teaspoon of the tahini paste on medium heat; add the garlic and sauté until golden brown and aromatic.
2. Combine all ingredients except the paprika in a food processor or blender and process until smooth. Add more water to smooth the purée.
3. Transfer to a serving bowl; sprinkle with the paprika and serve.



# RS2 No-Bake Nut & Raisin Granola Bar

YIELD: TEN 40 G SERVINGS  
(4 G OF MSPREBIOTIC™ RS2 PER BAR)

1 1/2 cups	rolled oats
1 cup	puffed rice cereal
2 tbsp	butter, unsalted
1/4 cup	honey (agave or maple syrup)
1/3 cup	brown sugar
1/2 tsp	salt
1/2 tsp	vanilla extract
2 tbsp	shredded unsweetened coconut
1/3 cup	raisins, chopped
1/3 cup	almonds, toasted and chopped
4 tbsp	MSPrebiotic™ RS2

1. To toast the almonds, heat the oven to 350°F, spread the almonds on a lined sheet pan and toast for 12 minutes or until golden.
2. In a large bowl, mix the oats, almonds, raisins, shredded coconut and MSPrebiotic™ RS2.
3. In a large microwavable bowl, add the butter, honey, and brown sugar. Microwave for 2 minutes or use a saucepan to melt the mixture.
4. Whisk in the salt and vanilla and combine well. Set aside to cool to below 60°C.
5. Pour the mixture over the oats and stir thoroughly using a rubber spatula. Mix until the oats are completely coated.
6. Press the mixture firmly into a tray lined with parchment. If you want thicker bars, use a smaller pan. Make sure to press firmly to prevent bars from falling apart when eating.
7. Place in the fridge for 2-3 hours, then cut to size.
8. Store in an airtight container in the fridge or on the counter.





# RS2 Blueberry Compote

YIELD: 2 1/2 CUPS

(2.5 G OF MSPREBIOTIC™ RS2 PER 30 G SERVING)

3 cups blueberries (fresh or frozen)  
3 tbsp fresh lemon juice  
1/4 tsp cinnamon, ground  
Pinch cloves, ground  
1 tbsp sugar  
5 tbsp MSPrebiotic™ RS2

**NOTE** Substitute any frozen fruit to this recipe to make different flavoured fruit compotes.

1. Place all ingredients except the MSPrebiotic™ RS2 in a medium saucepan and bring to a medium heat.
2. Once the mixture is bubbling, reduce the heat slightly and use a wooden spoon to muddle and mash the fruit.
3. Continue cooking over medium low heat for 10-12 minutes, occasionally mashing the fruit to combine.
4. Remove from heat and cool down by putting the mixture in the fridge for a few minutes. Use a thermometer to check that the temperature is below 60°C.
5. Once cool enough, stir in MSPrebiotic™ RS2 and mix well.
6. Transfer to a clean jar or container to cool thoroughly. Store in the fridge.

# RS2 Graham Cracker Tart Shell

YIELD: ONE 9" PIE CRUST, 8 SLICES

(5 G OF MSPREBIOTIC™ RS2 PER SLICE)

1 1/2 cups graham cracker crumbs  
1/4 cup brown sugar  
1/2 tsp cinnamon (optional)  
Pinch salt  
4 tbsp MSPrebiotic™ RS2  
1/4 cup unsalted butter, melted

1. If you're using whole graham crackers, finely crush them in a food processor or place them in a Ziploc bag and roll with a rolling pin.
2. Stir the graham crackers, brown sugar, cinnamon, salt, and MSPrebiotic™ RS2 together in a large bowl. Add the melted butter and stir with a fork until well combined.
3. Press the mixture into the bottom and up the side of a 9" pie plate. Use your fingers to compact the dough.
4. Chill the pie crust for at least 1 hour before filling. Cover if chilling the pie longer.



# RS2 No-Bake Strawberry Cheesecake

YIELD: ONE 9" ROUND CAKE, 8 SLICES  
(3 G OF MSPREBIOTIC™ RS2 PER SLICE)

1 recipe RS2 Graham  
Cracker Tart Shell  
1 1/2 cups fresh strawberries  
1/4 cup sugar  
3/4 cup heavy whipping cream  
1 1/2 cups light cream cheese  
2 1/2 tbsp MSPrebiotic™ RS2  
1/2 cup RS2 Blueberry  
Compote (optional)

1. Follow the recipe for the RS2 Graham Cracker Tart Shell until step 2, but do not add MSPrebiotic™ RS2 to the recipe. Cover the bottom of a 9-inch spring form pan with the crumbs and put in the fridge while preparing the filling.
2. Purée the strawberries and sugar in a food processor or blender.
3. Add in the cream cheese and blend until smooth.
4. Pour in the heavy cream and MSPrebiotic™ RS2 and continue blending until the mixture thickens well.
5. Pour the mixture over the prepared crust, cover with plastic wrap, and refrigerate overnight to firm up.
6. Store cheesecake in the fridge for up to 3 days. Decorate the cake to your liking or top with RS Blueberry Compote, if desired.



# Genome Prairie Cookbook

This project marked Prairie Research Kitchen's first foray into developing a cookbook aimed at promoting industry ingredients and agriculture research to a broad audience.

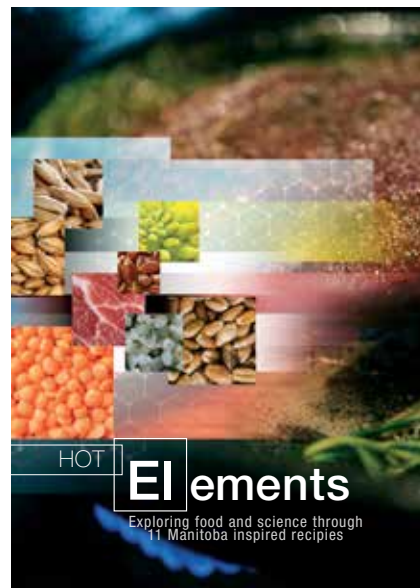
*Hot Elements* features ten recipes developed by RRC Polytech Culinary Arts student Aileen Lopez, who worked under the supervision of Culinary Research and Innovation Manager Joel Lamoureux. Each recipe showcases a base ingredient improved by a Genome Prairie research project.

Based in Winnipeg and Saskatoon, Genome Prairie develops and manages genomics and bioscience research that addresses regional priorities such as agriculture, human health, the environment, energy, and mining.

One of Genome Prairie's goals is to improve the quality, resilience, nutritional content, and yield of plants and animals used to feed the world. For instance, Genome Prairie and its collaborators have characterized and enhanced the flax plant's genome to ensure complete use of its seeds and fibres, and enhanced the canola plant's oil content and protein levels while reducing its fibre and saturated fatty acid content.

RRC Polytech's print shop designed *Hot Elements* and printed 500 copies of the book for an industry event that brought together agri-food researchers from around the world. College staff also helped produce some of the book's content. RRC Polytech Creative Communications student Manny Berkal-Sarbit provided photography.

The recipe for Lentil Perogies featured in this section is a take-off on one of the original recipes we developed as a capacity-building project for Manitoba Pulse and Soybean Growers - see page 20.



Genome Prairie develops and manages genomics and bioscience research that addresses regional priorities such as agriculture, human health, the environment, energy, and mining.

# Lentil Perogies

YIELD: 30 PEROGIES



## FILLING

1 cup	split red lentils
2 1/2 cups	water, cold
1/2 tsp	salt
1	garlic clove, sliced
1/2 cup	Trappist cheese or Reblochon, diced
3 tbsp	scallion, sliced

## DOUGH

1 1/2 cups	all-purpose flour, sifted
1/2 cup	red lentil flour, sifted
1/2 tsp	salt
2	eggs, beaten
1/3 cup	water, room temperature

**DID YOU KNOW?** Just 100 grams of dry split red lentils has more potassium than a large banana. Lentils are high in fibre and complex carbohydrates, and low in fat and calories. Their low glycemic index values and resistant starch content make them suitable for a diabetic diet.

## Filling

1. Place the lentils, water, salt and garlic in a pot and simmer for about 25-35 minutes until the lentils are tender. Strain and reserve the cooking liquid. Using a large spoon or potato masher, stir vigorously and incorporate the cheese with the lentil mixture to form a paste.
2. If needed, add some of the cooking liquid back into the mixture. Fold in scallions and let the mixture cool.

## Dough

1. In a stand mixer, place the sifted flours and salt into the mixing bowl. Using a dough hook, mix on low speed and incorporate the eggs and water.
2. Continue to mix the dough on medium speed for 3-5 minutes until the dough is formed and pulls away from the bottom of the bowl. (If the dough is sticky, add 1-2 tsp of flour on the work surface and knead by hand until smooth.) Wrap the dough with plastic wrap and rest in the fridge for 30-60 minutes.
3. Cut the rested dough into two halves and roll out the first half onto a lightly floured surface. Roll to 1/16" (2 mm) thick. Use a 3" (75 mm) pastry ring cutter to cut out circles from the rolled-out dough. Repeat with the second half of the dough.
4. Using a brush, wet the edge of each circle with water and place 1 tsp of the filling in the centre. Fold the dough over and seal by pressing firmly with your fingers. Place on a lightly floured surface.
5. To cook, bring a pot of salted water to a boil and cook the perogies in batches for 2-3 minutes. When they float to the surface, they are cooked. Drain and fry in a pan with oil and butter, or serve boiled.

# Prairie Cricket Farms

People around the world eat crickets as a protein source - a fact that inspired Manitobans Ryan and Lesley Stepler to build a cricket farm in their basement. Fast forward to 2019 and a million crickets later, when they approached Prairie Research Kitchen for support. Our task was to develop recipes featuring Prairie Cricket Farms's pure cricket powder, which is made from 100 per cent finely milled roasted crickets. The project was one of the first Tech-Access Canada Interactive Visits for PRK as a newly formed Technology Access Centre.

When it comes to nutrition, crickets have a lot to chirp about. They're not only high in protein but a complete protein source, containing all nine amino acids essential for human health. Packed full of B12, zinc and manganese, crickets are also an excellent non-dairy source of calcium. They provide an ideal ratio of Omega 3 fatty acids (6:3) and prebiotic fibre that supports gut health.

Crickets are a sustainable food source, too. They require less land, energy, food, and water to raise than conventional meat herds.

The recipes we developed are now featured on Prairie Cricket's website, where they are helping encourage more consumers to include crickets as a sustainable, nutritious part of their diet.

Crickets are a sustainable food source, too. They require less land, energy, food, and water to raise than conventional meat herds.

**NOTE** Although these recipes don't contain fish or seafood products, people with shellfish allergies may have mild reactions to cricket.

# Chocolate (Chirp) Cricket Cookies

YIELD: 2 DOZEN

70 g all-purpose flour  
120 g cricket flour  
4 g baking soda  
1.5 g instant espresso  
20 g cocoa powder  
140 g unsalted butter  
200 g brown sugar  
1 large egg  
8 g vanilla extract  
140 g dark chocolate, rough chopped

1. Combine the flours and baking soda in a small bowl.
2. Take 2/3 of the butter and brown it in a small saucepan, stirring continuously and being careful not to burn it. Once the butter has browned, transfer it to a heat-proof bowl and slowly stir in the remaining butter. Add the cocoa powder and espresso to the melted butter and stir until dissolved.
3. Add the chocolate mixture to a stand mixer fitted with a paddle attachment.
4. Add the sugar to the chocolate and mix on medium high until smooth and cooled down, about 1-2 minutes
5. Add the egg and vanilla and mix on medium high until light and fluffy.
6. Add the combined dry ingredients and mix on low for about 30-45 seconds, scraping as necessary, until all ingredients are evenly combined.
7. Stir in the chocolate chunks by hand.
8. Cover and refrigerate for at least 1 hour or overnight.
9. Heat the oven to 375°F. Scoop the cookie dough into 30 g portions and bake for 8-10 minutes.
10. Allow the cookies to cool 5-10 minutes before serving.

# Cricket Brownies

YIELD: 2 DOZEN SQUARES OR A 9" x 13" PAN

227 g unsalted butter, melted  
447 g white granulated sugar  
66 g cocoa powder  
5 g salt  
5 g baking powder  
14 g vanilla extract  
3 g instant espresso  
5 large eggs  
120 g water  
97 g all-purpose flour  
120 g cricket flour

## OPTIONAL

113 g toasted walnuts  
140 g chocolate chips

1. In the bowl of a mixer fitted with a paddle attachment, whisk together the melted butter and sugar. Add the cocoa powder, vanilla, and espresso powder. Add the eggs one at a time, scrape the bowl, then add the water and beat until light and fluffy.
2. In a separate bowl, whisk together the remaining ingredients.
3. Add the dry ingredients into the wet and mix until fully incorporated. Fold in the optional additions.
4. Transfer to a greased 9" x 13" pan and bake at 350°F for 28-30 minutes, until a toothpick comes out clean. Allow to cool fully before serving.

# Indigenous Engagement

# 4

Indigenous peoples are significantly underrepresented in many aspects of business, education, and training, including Manitoba's food development sector. From its inception, Prairie Research Kitchen has been committed to bridging this gap by building Indigenous knowledge and engagement in food development opportunities and training.

Our commitment supports RRC Polytech's strategic priorities aimed at embracing and reflecting First Nations, Métis and Inuit knowledge, cultures, and traditions in its mission.

RRC Polytech has actively taken on the responsibility of embedding the Truth and Reconciliation Commission of Canada's Calls to Action. These include #92, which calls upon Canada's corporate sector to commit to meaningful consultations and relationship-building with Indigenous peoples, ensuring Indigenous people have equitable access to jobs, training, and educational opportunities, and providing education for management and staff on the history of Indigenous peoples.

As a signatory to the Manitoba Collaborative Indigenous Education Blueprint, RRC Polytech has made a public pledge to advance Indigenous education and achievement in the province by supporting Indigenous student success, and by strengthening partnerships with Indigenous communities.



RRC Polytech's current five-year strategic plan emphasizes elevating student success through solid experiential learning opportunities in partnership with employers. It commits us to radically increase the number of students involved in curriculum-based projects that focus on culinary research by students, guided by faculty, and driven by industry.

PRK fully recognizes the power and potential of the Indigenous community to be strong contributors to culinary innovation and economic prosperity.

We support Indigenous entrepreneurship by partnering our experienced faculty and research staff with Indigenous entrepreneurs, businesses, and community organizations to solve problems, develop opportunities, and create hands-on learning experiences for students.

PRK partners with RRC Polytech's School of Indigenous Education (SIE) to prepare Indigenous students for careers in the food industry. The Culinary Skills program provides students with fundamental culinary skills and knowledge, including basic business skills - and, more importantly, content related to traditional foods and cooking methods. The program includes hands-on training, theory, and paid co-operative work placements in the culinary industry.

Like many culinary programs, our academic schedule affords very little classroom time for research-specific projects. PRK responded to this challenge by creating a three-day Introduction to Research student project during a break in classes. PRK has also worked with Indigenous Culinary Skills instructors Chef Joseph Alex and Chef Patrick Anderson on recipe development, wild rice milling, and employee training opportunities for Indigenous students.

In 2021, we began working with Indigenous Research Liaison Jamie Chahine to explore avenues for connecting Indigenous clients and students with the PRK for research collaborations, learning opportunities, and training. The strategic partnerships she has forged over the past year have created new opportunities for economic reconciliation and knowledge transfer - opportunities that will benefit communities, businesses, and industry.

Jamie also led the development in 2021 of the Indigenous Food Business Stories webinar, which combined food development and Indigenous storytelling to foster discussion and build relationships between community and economic development representatives, aspiring researchers, entrepreneurs, and Indigenous business leaders.

Our commitment to Truth and Reconciliation involves active participation from our staff. All PRK team members have completed the 4 Seasons of Reconciliation training. This program explores the truth of Canada's history, as well as the intergenerational trauma and systemic barriers that resulted from it. PRK staff have also participated in the Blanket Exercise, a guided simulation of the colonization of Canada from the original treaties to the residential schools to today. In the kitchen, we work with Indigenous staff and students to encourage and support inclusion of traditional practices and ceremonies into our daily work. Our team actively participates in Indigenous cultural events hosted throughout the RRC Polytech community.

This chapter brings together projects we have worked on featuring Indigenous foods, businesses and projects involving the chefs and students from SIE's Culinary Skills program.

Indigenous Food Stories:



Growing Your Indigenous Food Business:





# Roxanne Kent

PRK RESEARCH ASSISTANT

Roxanne joined Prairie Research Kitchen in 2020, and now puts her culinary skills to work supporting product development projects.

Community connection is especially important to Roxanne: in addition to graduating from RRC Polytech's Culinary Arts program in 2021 with honours and various awards, she earned a social work degree in 2015. One of her long-term goals is to work with low-income families to teach them how to cook nutritious meals.

As a student during the COVID-19 pandemic, Roxanne completed her second co-op with PRK by working on a project designed to convert excess vegetables into a high-protein dehydrated soup for Harvest Manitoba. When employees were sent home to work, Roxanne was reassigned to a project she could start at home that would incorporate her heritage and local ingredients.

One of her creations for PRK is a rich, flavourful wild blueberry sauce. She deliberately chose a sauce that would pair well with gamey meats such as bison, duck, and venison, or could be used to top toast and pancakes. The recipe features an infusion of sweetgrass, a traditional medicine that has also been used as tea or in a marinade.



Roxanne is Ojibwe from the Wabaseemoong Independent Nations in northwestern Ontario.

In Anishinaabemowin (Ojibwe), the name of Roxanne's blueberry sauce is Wenoodizii Magan Miinan Apagajiganan. The name, which was selected by Corey Ralph Whitford, instructor, Indigenous Language, School of Indigenous Education at RRC Polytech, means "The rich flavour of blueberry that you can put on top of something." It is pronounced *weh-NO-deh-ZEE mah-gan, mee-NUN, ah-PAH-gah-JIG-ah-nun.*

Find out more:



# Wild Blueberry Sauce

YIELD: ABOUT 2 CUPS

## SWEETGRASS INFUSED VINEGAR

4 g sweetgrass, torched  
100 g white vinegar  
1 g sage, fresh

## BLUEBERRY SAUCE

420 g wild blueberries, frozen  
84 g sugar  
17 g birch syrup  
1 g kosher salt  
17 g maple syrup  
42 g sweetgrass vinegar  
(see above)  
84 g water  
4 g pectin, rapid set



## Sweetgrass infused vinegar

1. Using a small torch, burn the sweetgrass until fully torched.
2. Combined the sweetgrass, sage and vinegar together and mix.
3. Allow to steep in fridge for one day.

## Blueberry sauce

1. Place the blueberries in a saucepan. Over medium-low heat, heat the blueberries until warm.
2. Pass the blueberries through a food mill.
3. Combine the strained blueberries and remaining ingredients, except sugar and pectin, into a saucepot.
4. In a separate bowl, combine the sugar and pectin.
5. Add the sugar and pectin mix to the blueberry mix.
6. Bring the entire mixture to a boil. Turn heat to low and simmer for about 30 minutes, until reduced by about 25%.

**NOTES** This sauce is a versatile topping for savoury and sweet applications alike. Roxanne recommends pairing it with gamey meats such as bison, duck, and venison, or pork chops. For sweet pairings, she suggests bannock or ice cream.

# Rayne Ryle-Cote

RRC POLYTECH STUDENT

During a co-op work placement at Prairie Research Kitchen in 2022, Rayne Ryle-Cote, a student in RRC Polytech's Compass Skills program, created a new sauce that integrated her culture, family, and part of herself.

Rayne is Anishinaabe (her mother is from Lake St. Martin and her father is from Cote First Nation). After enrolling in the Compass Skills program, which focuses on career exploration, goal setting and self-reflection, she tapped into a deep desire to learn more about Indigenous cultural teachings. While there, she realized she had a strong interest in cooking inspired by her mother.

Drawing on her grandparents' love of cranberry sauce (always a meal-side staple for meats, fish, and bannock), she experimented with finding a balance that included notes of sweet and sour, a personal favourite. PRK's culinary research team suggested ways to blend some of the elements, which include dried juniper berries and raspberries. The sauce can be used for dipping and coating, and works best with meatballs, fried fish, chicken nuggets, and fried bannock.

Scaling up and packaging Rayne's sauce presented PRK with the opportunity to test new equipment in the Food Processing Lab and model a student recipe development process for products destined for larger-scale production and commercialization.

Rayne is continuing her studies in Culinary Skills and is working with PRK to package and upscale production of the sauce. She dreams of a career that will take her coast to coast, working with Indigenous people, learning, and sharing her teachings along the way.



It was important to Rayne that her sauce bear an Anishinaabemowin name in honour of her heritage. She worked with RRC Polytech Indigenous Language Instructor Corey Whitford to choose a name. *Wiishkobi dago zhiiwizipogwad mawinzwaanwinan baashkiminasigan* means "sweet and sour berry sauce". It is pronounced *wish-ko-BEH dah-GO ZHEE-wih-zid-pah-gwid man-win-ZWAH-wih-nin bash-KEE-mih-NAH-sih-gin*.

Find out more:



# Sweet and Sour Berry Sauce

YIELD: ABOUT 1 LITRE

## JUNIPER BERRY-INFUSED VINEGAR

30 g juniper berries  
100 g white vinegar

## SWEET AND SOUR SAUCE

155 g raspberry puree, seedless  
245 g cranberries, whole frozen  
460 g honey, liquid  
505 g water  
90 g juniper berry vinegar  
(see above)  
40 g corn starch

## Juniper berry-infused vinegar

1. Finely blend the juniper berries in a processor on high speed for 2 minutes.
2. Add the juniper berries and vinegar to a saucepan and heat to just a boil to steep the flavour from the berries.
3. Allow the mixture to cool at room temperature before setting it in the fridge overnight.
4. Strain the juniper berries from the vinegar.

## Sweet and sour sauce

1. In a small bowl, whisk together the 100 g water and corn starch to create a slurry, and set aside.
2. Combine all ingredients in a medium-sized saucepan.
3. Over medium-high heat, bring the mixture to a boil, then reduce to medium-low. Simmer until the cranberries have burst.
4. Slowly whisk in the cornstarch slurry until well combined.
5. Return the mixture to a simmer and cook for 3 minutes to activate the cornstarch slurry, until the mixture begins to thicken.
6. Transfer the mixture to a blender or Thermomix and blend on high speed for 1-2 minutes.
7. Transfer the sauce to a container and refrigerate overnight.

Serve with your favourite appetizers, such as chicken nuggets, grilled meat skewers - or onion rings!



# Onion Rings

YIELD: 1 LARGE ONION

## DRY DREDGE

100 g all-purpose flour  
1 g kosher salt

## WET BATTER

180 g water  
7 g garlic powder  
7 g smoked paprika  
100 g all-purpose flour  
3.5 g kosher salt

## BREADCRUMBS

100 g breadcrumbs  
1 g kosher salt  
1 large onion, 2 cm slices

1. In a mixing bowl, whisk to combine the first measure of flour and salt.
2. In a separate mixing bowl, whisk to combine the garlic powder, paprika, flour, salt and water.
3. In a third bowl, combine the breadcrumbs and salt.
4. Heat a deep fryer or pot of canola oil to 350°F/180°C.
5. Perform a 3-step dredge/batter step by tossing the sliced and separated onions rings in each bowl, starting with the dry dredge, then the wet batter (allowing excess batter to drip off), and finally the breadcrumbs.
6. Place the coated onions rings in deep fryer for about 2 minutes until golden brown and allow to drain on a rack before serving.

Serve with a dipping sauce of your choice, such as Rayne Ryle-Cote's Sweet and Sour Berry Sauce.



# The Stak Co.

The Stak Co. is a Manitoba-based and Métis-owned award-winning agribusiness that produces Manitoba-grown vegan, gluten-free, low sodium, high protein powerhouse pulse mixes.

Since launching five years ago, the company has introduced four dry bean blends to its product line: Northern Classic Chili, Tortilla Soup Fiesta, Pea Soup, and Loco Burrito. Owner Suzan Stupak partnered with Prairie Research Kitchen in 2021 to develop a new gluten-free, vegan product. She also wanted to engage students in creating new recipes that would promote the consumption of beans, which we share in the following pages.

Stak Co. has been a “labour of love” for Suzan. She says she inherited her love of feeding people from her grandmother, “an incredible woman who always made everyone around her feel special.” Suzan learned at an early age how to cook nutritious meals from scratch to help her father cope with dietary restrictions and manage health issues. She shared her story as a featured speaker in the Indigenous Food Business Stories webinar we launched in 2021.

Stak Co.’s focus on pre-packaged pulse products emerged from market research highlighting the fact that consumers want to add more pulses to their diets for their health benefits, but don’t know how to cook them. That was a gap Suzan knew she could fill. Stak Co. products are now available at Safeway, Sobeys, IGA, Food Fare, Miller’s Meats, and other retail locations. Suzan has also partnered with the North West Company to deliver Stak Co. products to consumers in northern communities where access to nutritious food products can be a challenge.



Consumers want to add more pulses to their diets, but don’t know how to cook them.” **SUZAN STUPAK**

# Lemon Garlic White Bean Bruschetta

YIELD: 4 SERVINGS, 2 PIECES PER SERVING, 150 G PER SERVING

## WHITE BEAN BRUSCHETTA

1 cup	white beans, cooked
1/4 cup	cherry tomatoes, diced small
2 tbsp	white onion, diced small
1 tbsp	garlic, minced
2 tbsp	lemon juice
2 tbsp	parsley, chopped
1/3 cup	parmesan, shredded
8 slices	baguette, sliced 1/2" at an angle
1/3 cup	olive, extra virgin
1 tsp	salt
1/2 tsp	black pepper, ground
1 tsp	lemon zest

## GARNISH

Parmesan, grated  
Parsley, chopped

## Lemon zest

1. Preheat the oven to 180°C/350°F.
2. Brush the olive oil onto both sides of the bread. Set remaining oil aside.
3. Mash half the beans in a bowl. Add the remaining oil and lemon juice into the bowl, and mix. Add the tomatoes, onions, garlic, parsley, and parmesan to the bowl. Mix to combine.
4. Preheat a large pan over medium heat.
5. Place the baguette slices into the pan, turning once the bread is golden brown, about 1 minute.
6. Place the slices on a parchment-lined baking sheet. Top each slice with 1/4 cup of the bean mixture. Sprinkle each slice with a little extra parmesan.
7. Bake until the top is golden brown, about 10 minutes.
8. Remove the bruschetta from the oven, and garnish each with chopped parsley and lemon zest.



# Summer Vegetable White Bean and Pesto Ragout

YIELD: 8 SERVINGS, 1 CUP PER SERVING

## WALNUT PESTO

1/3 cups walnuts, chopped rough  
3/4 cups parsley, chopped fine  
2 tsp garlic, minced  
3/4 cups olive oil, extra virgin  
1/4 tsp salt  
1/8 tsp black pepper, ground

## RAGOUT

4 cups white beans, cooked  
2 cups zucchini, diced medium  
2 cups cherry tomatoes, halved  
4 cups baby spinach, chopped rough  
4 cups low sodium chicken stock  
3 tbsp olive oil, extra virgin  
2 tbsp lemon juice  
2 tsp lemon zest  
1/2 cups asiago, shredded  
1 recipe walnut pesto  
(see above)  
1 tsp salt  
1 tsp black pepper  
Chili flakes, to taste (optional)

**NOTE** Pine nuts can be substituted for the walnuts. If you're making the pesto in advance, bring it to room temperature before serving.

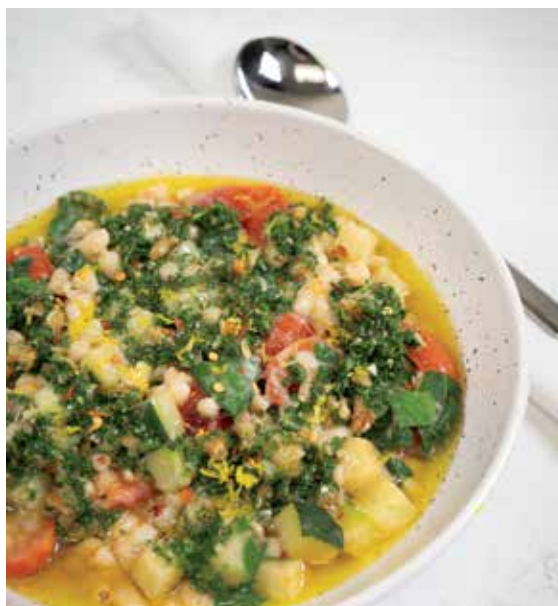
## Walnut pesto

1. Combine all ingredients in a bowl. Cover and set aside until needed.
2. Stir before using.

## Ragout

1. In a large pot over medium-high heat, add the oil. Once the oil is hot, add the tomatoes. Sauté the tomatoes until they begin to blister, about 30 seconds.
2. Add the zucchini to the pot. Continue to cook until the zucchini begins to brown, about 1 minute.
3. Add the beans, stock, salt, and pepper to the pot. Bring to a simmer. Simmer until liquids begin to thicken, about 5 minutes.
4. Add the spinach, lemon juice, and zest. Cook until the spinach is wilted. Remove from heat.

Serve while hot and garnish with asiago, walnut pesto, and chili flakes (optional).





# Culinary Skills

The School of Indigenous Education (SIE) at RRC Polytech runs a one-year certificate program in culinary skills for students of Indigenous ancestry. During this course, students learn the fundamentals needed for a career in the food service industry, including culinary techniques, in-depth food knowledge and introductory business skills.

Indigenous cultural content is included throughout the curriculum. The program also includes a four-month paid co-op work placement. Students in the program can transfer to the two-year RRC Polytech's Culinary Arts program after the first year.

The one-year certificate program is fast-paced and jam-packed to ensure students receive all necessary skills before graduating.

Prairie Research Kitchen works closely with the School of Indigenous Education to identify opportunities for students and communities to collaborate on projects related to food and agriculture. In the future, program development will also be guided by conversations around food entrepreneurship and community development.

SIE's Social Innovation and Community Development program helps students develop practical skills and work experience needed for employment in socio-economic development and environment-related roles during their first year. The second year presents options for students to specialize in community development or Indigenous social entrepreneurship. Combined with culinary talent and PRK resources, these skills may soon start yielding the next wave of up-and-coming Indigenous food entrepreneurs.





# Joseph Alex

CULINARY SKILLS INSTRUCTOR -  
SCHOOL OF INDIGENOUS EDUCATION

Joseph is from Osoyoos Indian Band in Oliver, BC. He has been involved in RRC Polytech's Culinary Skills program in the School of Indigenous Education since it began five years ago. He is now the program's lead Culinary Skills Instructor. As an Indigenous Red Seal Chef, he aims to guide the next generation of Indigenous cooks and chefs.

Joseph graduated from RRC Polytech's Culinary Arts program in 2013. He honed his professional skills as sous chef at Inn at the Forks, where he helped the executive chef with menu and recipe development, and Indigenous-inspired features whenever the ingredients were available. He also trained new employees and culinary students.

This experience serves him well in his current role. Joseph has created and delivered course content in the lab, classroom, and kitchen, where he also takes part in recipe development. He acts as a bridge between students and RRC Polytech's services and supports.

Joseph has been passionate about teaching the next generation of Indigenous cooks and chefs from the very start of his career. He's led several outreach and recruitment initiatives, and events such as Culinary Career Day, where he encourages Indigenous high school students to enrol in RRC Polytech's Culinary Skills program.

Joseph also believes in giving back to the community. In the summer of 2022, he headed an APTN Indigenous Day Live event, selling bison sliders, elk skewers and blueberry wild rice salad to raise funds for Bear Clan Patrol, a volunteer safety organization supporting Winnipeg's Indigenous population.

The Three Sisters Soup recipe on the next page was developed by Joseph to provide a professional development opportunity for PRK Research Assistant Roxanne Kent. The recipe lives on (without smoked duck) for the menu at Wiisinin, the short order kitchen Indigenous Culinary Skills students set up every April.



Teaching lets me reach back to my roots. I want to show our young and aspiring Indigenous cooks that we can achieve so much more. Inspired by our Indigenous culture, I have been experimenting with more ingredients from our land and striving to incorporate our ways of preparing, preserving, and serving food. I will always continue to learn and bring the traditions of our past into the present - including our foods and the way we eat." **JOSEPH ALEX**

# Three Sisters Soup with Smoked Duck

YIELD: 4 CUPS

## SOUP

2	medium squashes (butternut or spaghetti, preferably)
1	large sweet potato
2	small carrots
3	celery stalks
1	small red onion
60 g	ginger
150 g	beans (any variety, canned works better)
150 g	corn (canned, frozen, or fresh)
2 l	water or vegetable stock (more if needed)
15 ml	rubbed sage
5 ml	sumac
2-3	sprigs thyme, fresh
1	bay leaf
2.5 ml	sumac for garnish
45 ml	canola oil (any neutral oil is okay)
	Salt and pepper to taste

## SMOKED DUCK

1	duck breast
15 ml	coarse salt
15 ml	cracked pepper
7.5 ml	maple sugar

**DID YOU KNOW?** Many Indigenous communities refer to corn, squash, and bean as the Three Sisters. Planted together in spring, the corn, beans, and squash grow together and sustain one another throughout the summer and fall. The corn stalk provides support for the beans, which climb high above the other plants to reach the sun. The squash shades the soil and locks in moisture. The bean plant captures nitrogen from the atmosphere and releases it into the soil as fertilizer for the corn and squash. The corn, beans, and squash also complement each other nutritionally, providing a healthy, sustainable meal.

## Soup

1. Peel and small dice the squash, sweet potato, carrots, and ginger. Dice the celery.
2. Warm the oil in a suitable heavy-bottomed pot and add the diced vegetables.
3. Cook until bright and slightly softened, then add sumac and sage and cook briefly before adding the water or stock.
4. Bring to a simmer, add the thyme sprig and bay leaf, and cook until vegetables are soft enough to purée.
5. Remove the soup from the heat, pick out the thyme and bay leaf, and discard them.
6. Using a blender, purée the soup in batches. An immersion blender works great.
7. Warm the soup again and add salt and pepper to season.
8. In a separate sauté pan, using a little oil, sauté the beans and corn until warm and soft, season them with salt and pepper, and use as a garnish.
9. Place the warm puréed soup in a soup bowl, garnish with the corn and bean mix, and place 2 to 3 slices of the smoked duck breast on top of the soup.
10. Dust with sumac and serve.

## Smoked Duck

1. Pat-dry the duck breast and score the fat and skin. Place the duck breast in a cooler unwrapped to develop a pellicle - a minimum 1 hour.
2. Warm the smoker to 190°F using the wood of your choice (maple works well).
3. Season the duck breast and place it in the smoker for about 30 minutes. Just a hint of smokiness is needed.
4. Remove the duck from the smoker and let it rest.
5. Preheat the oven to 400°F.
6. Warm a cast iron pan (or other oven-safe pan), then place the duck breast skin-side down on the pan and brown it. Make sure the pan isn't too hot - you want to render the duck fat and save it for other cooking.
7. When the skin starts turning golden-brown and crispy, flip over the duck breast and place the pan in the oven for approximately 5-7 minutes, or until internal temperature has reached 135-138°F.
8. Rest the duck breast for no less than 10 minutes.

# Patrick Anderson

CULINARY SKILLS INSTRUCTOR - SCHOOL OF  
INDIGENOUS EDUCATION

Cooking has been Patrick's life since he began cutting fries at the Red Top Diner at age 16. After working at the Old Spaghetti Factory and the Confusion Corner Bar and Grill, he signed up for RRC Polytech's Culinary Arts program at age 23 and graduated with honours in 2014.



For his final practicum, Patrick worked at Deer + Almond and became sous chef there the following year. Planning and catering events such as Table for 1200, the Rainbow Trout music festival, and RAW:almond for five years in a row fuelled his passion for catering. He challenged the Red Seal exam in 2018 while working at The Tallest Poppy restaurant, and opened a plant-based catering business in 2020.

When the pandemic struck, Patrick enrolled in RRC Polytech's Certificate in Adult Education to pursue his dream of becoming an instructor - a role that allows him to pass on what he has learned to the next generation of chefs in Manitoba. "The future of Canada's culinary world is Indigenous, and I feel so fortunate to be a part of the journey to success for so many young chefs," says Patrick, who is Métis.

In the summer of 2022, the PRK team asked Patrick to work with their new student/research assistant, Rayne Ryle-Cote, to get her accustomed to working in a research kitchen. Under Patrick's guidance, Rayne conducted trials on the Wild Rice Pancake Recipe on the next page to better understand the research process and fine-tune a great dish.

"When I think of these pancakes, I think of the beginning of Rayne's culinary journey," says Patrick. "This dish symbolizes a new beginning, a fresh start, and inclusivity. Plus, they're super tasty!"

**FUN FACT** Patrick loves going for bike rides with his family. "Getting back to nature is fuel for my soul and helps me stay connected to the environment."

# Wild Rice Buttermilk Pancakes

YIELD: 16 PANCAKES

324 g or 1 1/3 cups	bread flour
164 g or 2/3 cup	wild rice flour
3 g or 1 tsp	salt
23 g or 1 tbsp + 2 tsp	sugar
43 g or 3 tbsp	baking powder
1000 g or 4 cups	buttermilk
106 g or 2	eggs
46 g or 3 tbsp	melted butter

1. Combine the wild rice flour and buttermilk, soak for 10 minutes.
2. Combine the flour, salt, sugar, and baking powder.
3. Sift the dry ingredients together.
4. Melt the butter in a saucepan, cool to room temperature, and mix with wild rice buttermilk milk and eggs.
5. Add the wet ingredients to the dry. Mix until just smooth. Try not to overmix.
6. Let the batter sit for 20 minutes at room temperature before cooking.
7. Use a 2 oz ladle to place the batter on the cooking surface.
8. Cook for 2-3 minutes each side at roughly 325°C.

**NOTE** When I make these at home, I add a small amount of sunflower butter, maple syrup, and any jam I have on hand. Roxanne Kent's Wild Blueberry Sauce (page 96) is my preferred choice.



From catering my first event with my own company, to working with the renowned Prairie Research Kitchen team, it's hard to choose one highlight that stands out from the past five years. I am most proud of being able to work alongside my students to give back to the community. Last winter, we delivered pizza and muffins to Main Street Project on Christmas Eve, and on Indigenous People's Day, we raised over \$1,200 for the Bear Clan by selling Blueberry BBQ Elk Skewers and Wild Rice Pilaf at The Forks. There is no better feeling than using your craft to help those in need." **PATRICK ANDERSON**

# Wild Rice Bannock

YIELD: 1 LARGE PIECE

210 g	all-purpose flour
15 g	baking powder
2 g	table salt
90 g	wild rice flour
15 g	canola oil
200 g	water, 40°C

1. Preheat the oven to 176°C/350°F.
2. Combine all the dry ingredients in a mixing bowl.
3. Form a well in the centre of the flour.
4. Add in the oil and water.
5. Slowly incorporate the flour into the liquid with a spatula while slowly spinning.
6. Make into a dough ball. Do not overmix.
7. Lightly grease a quarter sheet pan with canola oil.
8. Place the dough onto the pan and press out firmly until 1 inch thick.
9. Place the pan in the oven for 20 minutes.
10. Remove the bannock from the oven and let cool.



# Introduction to Research

## PILOT PROGRAM

RRC Polytech's one-year Culinary Skills certificate program is packed with skills training and cultural events for the students, which doesn't leave a lot of time for students to explore other topics such as research and food product development - but a new pilot program has shown us one way to bridge the gap.

In 2021, the Prairie Research Kitchen team spotted an opportunity to offer an introduction to culinary research to two students in the certificate program during the short gap between the end of classes and the beginning of winter break.

Over the course of three days, the two students were faced with a challenge: to develop an easy-to-serve product incorporating as much lentil flour as they could without changing the sensory characteristics of the product. The students chose to develop two baking items: cheesy focaccia pizzas and pumpkin lentil muffins. In total, they produced 154 delicious muffins and 480 focaccia pizzas, all incorporating 35% lentil flour.

Based on the success of this pilot project, Prairie Research Kitchen is hoping to expand the Introduction to Research course for future years. PRK has proposed hiring up to five students from the SIE Culinary Skills certificate program each December to complete an expedited research project incorporating a novel ingredient into a common recipe, under the supervision of PRK staff and Culinary Skills instructors.

The first day introduces students to research methods, brainstorming recipes, and ingredient substitutions, shows them how to conduct experimental trials based on their research, and teaches them how to record information and observations in spreadsheets and lab books.

The second day challenges students to refine their results based on additional research and discussions, and to standardize the final recipe for scale-up.

The last day is reserved for scaling up production and repeating the results, batch after batch, while maintaining consistent quality. All product resulting from the final day is donated to Main Street Project, a local community organization serving Winnipeg's most vulnerable residents.

Not only do the students gain paid work experience and culinary research skills, but they also learn how to succeed in a kitchen team environment while making a meaningful contribution to the community.



# Pumpkin Lentil Muffins

YIELD: 12 X 75 G MUFFINS

## DRY

270 g	all-purpose flour
50 g	lentil flour
3 g	salt, kosher
2.5 g	baking powder
5.5 g	baking soda
5 g	cloves, dry ground
2.5 g	cinnamon, dry ground
3 g	nutmeg, dry ground

## WET

85 g	butter, unsalted, at room temperature
85 g	canola oil
310 g	white sugar
2	eggs
120 g	pumpkin puree, canned
75 g	water

## STREUSEL

20 g	all-purpose flour
20 g	lentil flour
65 g	white sugar
70 g	rolled oats
0.5 g	cinnamon, dry ground
60 g	butter, unsalted, melted



1. Preheat the oven to 190°C/375°F.
2. Spray a 12-cup muffin pan with non-stick cooking spray and line with muffin cups.
3. In a medium bowl, whisk together all dry ingredients. Set aside.
4. In a mixer fitted with a paddle attachment, cream the butter, oil and sugar on medium-high speed for 2 minutes, scraping the sides as necessary.
5. Add the eggs one at a time until fully incorporated.
6. Add in the pumpkin purée and mix until combined. Scrape the sides of the bowl.
7. Add in the dry ingredients and mix until incorporated.
8. Portion 75 g of the batter into each individual muffin tin.
9. Add 15 g of the streusel on top of the muffins, dispersing evenly.
10. Bake at 190°C/375°F for 35 minutes until a toothpick comes out clean.
11. Take out of the oven to cool on a cooling rack.

**FUN FACT** The health benefits of lentils and other pulses - including their low GI values, heart-friendly nutrients, and impact on weight loss, cholesterol, and blood pressure - make them an ideal kitchen staple, especially in the diabetic kitchen. According to some studies, lentils improve glucose tolerance, which reduces your risk for Type 2 diabetes. Lentils (like other pulses) lower your post-meal glucose and insulin responses. One study has shown that this benefit extends to a meal eaten four hours later!



# Our People, Our Recipes

# 5

## PRAIRIE RESEARCH KITCHEN EMPLOYEE RECIPES

Just as great ingredients work together to produce the perfect dish, our people bring together a variety of backgrounds, experiences and skill sets to serve up successful projects for our clients and work experiences for our students.

Our diversity is one of our greatest strengths, and so is the love we all share for great food. As a workplace, Prairie Research Kitchen is the envy of many thanks to our team-building potlucks and surprise snacks, where we share our latest creations, favourite finds, and cherished family recipes.

Now we share some of those with you. In this chapter, each member of our team contributes a favourite recipe: either one they created during their time at PRK, or a personal favourite from another source.

It is important to acknowledge that our achievements over the past eight years would not have been possible without the support of an entire team dedicated to our success. Many people took a chance on Prairie Research Kitchen and our unique blend of culinary research and student learning. A shout-out to RRC Polytech's past and present senior leadership teams, marketing and communications department, and all the employees and students who joined us along the way, including the chef instructors and research chefs who contributed to building our program. Thank you for contributing your talents to complement ours.



Since its inception, the PRK team's core values include: enthusiasm for the food industry, creating value for stakeholders, respectful communication, and a commitment to inclusion and diversity.



# Ali Salimi Khorshidi

RESEARCH MANAGER

Ali is a true multi-disciplinarian who comes to Prairie Research Kitchen from a wide-ranging background that includes chemical engineering process design and cereal chemistry.

He's served in research and development and technical advisory roles for the pharmaceutical and food industries and has over 15 years' experience in multi-disciplinary research, post-secondary teaching, mentorship, and product/process development.

Ali chose this recipe because it has been such a big part of so many good memories. Kabob Koobideh is one of the main traditional dishes of his home country, Iran, and is representative of many aspects of Persian food culture.

//

I've been impressed by how a team of people with different expertise and backgrounds can work together in the most effective, integrated and organized way possible. I've learned a lot about food product development through our collaborations with the food industry, chefs, and food scientists within and outside RRC Polytech." **ALI SALIMI KHORSHIDI**

**FUN FACT** Ali was so excited about a PRK project involving a 3D food printer that he started producing plastic prints at home for his sons with a 3D printer of his own.

# Kabob Koobideh (Grilled Minced Meat Kabob)

Source: persianmama.com

YIELD: 10 KABOBS (4 SERVINGS OF 2 PER PERSON)

1 1/2 lbs	ground beef (80-85% lean)
1 lb	ground lamb (80-85% lean)
1 1/2	medium yellow onions, quartered
3	garlic cloves, peeled and minced
1	egg
1 tsp	salt
1 tsp	sumac (sold at Middle Eastern markets)
1/2 tsp	black pepper, ground
1/2 tsp	turmeric powder
1/4 cup	butter, melted (for brushing over the kabobs after grilling)

## GRILLED VEGETABLES

4	ripe but firm Roma tomatoes
1	large green bell pepper, stem removed, deseeded, and quartered

Olive oil (for brushing over the vegetables before grilling)

1. For best results, use fresh (not previously frozen) meat at room temperature.
2. Finely chop the onion pieces in a food processor until juicy and strain the juice from the processed onion. Discard the juice. Add the onion pulp to a medium bowl.
3. Add the ground beef and lamb, minced garlic, salt, spices, and egg to the bowl. Knead the ingredients for several minutes until the mixture is paste-like and sticks together without falling apart.
4. Wet your fingers so the meat does not stick to them when you are making the kabobs. Divide the meat into 10 equal balls. Holding one of the balls of meat in the palm of your hand, place the skewer on top of it and squeeze the meat around the skewer, squeezing from top to bottom. Cover the middle section of the skewer; leave the top and bottom of the skewer clear. The meat should be about 1/2 an inch thick all around the skewer.
5. Set the skewer on a shallow baking sheet with sides so the meat doesn't touch the floor of the baking sheet. Continue making the rest of the kabobs.
6. Place two square metal pipes lengthwise and parallel to each other on the top and bottom of your grill's cooking grate. Place the tip of the skewers on the top pipe and the skewer handle on the bottom pipe. This raises the skewers, preventing the meat from touching the hot grate, where it will stick and fall off.
7. Skewer vegetables separately from the kabobs, and on thinner skewers.
8. Start grilling the veggies first. Halfway through grilling, start the kabobs.
9. Fit as many skewers as you can onto the grill while leaving space between them. Begin turning the skewers in order for a short time to firm up the meat. Be careful not to overcook them. Continue turning the kabobs until they are grilled on the outside with no pink on the inside, but still juicy.
10. Place the cooked kabobs into a container lined with aluminum foil. Cover them until they are ready to serve.
11. When they are ready to serve, use a piece of flat bread (sangak, soft lavash, or pita) larger than the palm of your hand to grab each kabob and slide it off the skewer onto the serving platter. Brush melted butter over the kabobs.



# Anna Borys

## CULINARY RESEARCH ASSISTANT

After working as a freelance photographer, Anna enrolled in RRC Polytech's Culinary Arts program, where she graduated top of her class. Her role at Prairie Research Kitchen allows her to bring food and photography together.



Thanks to her cooking and recipe development skills, she is valued as a student mentor, while our clients have often benefitted from her food photography skills. She also contributes to PRK's Sensory Evaluation training, product development, and prototyping.

Anna developed this kebab recipe for Juno Food Labs while still a student in the Culinary Arts program and a part-time employee for our Culinary Research program. All the fun, fresh condiments, toppings, and Middle Eastern flavours make it one of her favourites.

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I'm proud of how Prairie Research Kitchen has evolved over the past five years. What started as a couple of us working in shared kitchen space has now become a whole team working in state-of-the-art kitchens, discovering and playing with fun and innovative food concepts and ideas." ANNA BORYS

**FUN FACT** Anna is devoted to the art of *tiny baking*, where she scales down average-sized recipes into miniature versions she can share through photography and video.

# Kofta Kebabs

Source: Juno Food Labs Development Project

1 pkg (454 g)	Bump™ Plant-Enhanced Ground Beef
1 tbsp	garlic, minced
2 tsp	kosher salt
1/4 cup	onion, grated
1/4 cup	parsley, finely chopped
1 tsp	coriander, ground
1/4 tsp	cinnamon, ground
1/4 tsp	allspice, ground
1/8 tsp	cayenne, ground
1/2 tsp	cumin, ground
1/8 tsp	ginger, ground
1/4 tsp	black pepper, ground
1	egg, beaten
1/2 cup	panko crumbs

1. Turn on the grill to high heat, and spray with non-stick spray oil.
2. In a large mixing bowl, add all ingredients and mix until well combined.
3. Divide the meat into 8 equal-sized portions. Using metal or soaked bamboo skewers, form the meat mixture portions around the skewers. (Soaking the bamboo skewers will help prevent them from burning while they're on the grill.)
4. Cover and refrigerate the meat skewers for a minimum of 20 minutes (or up to 1 day). Refrigerating the skewers helps the meat to firm up and prevents it from falling apart on the grill.
5. Grill the meat skewers until internal temperature reaches 71°C (160°F). Let rest for 5 minutes before serving.

Serve with a variety of sides such as a pita, tzatziki sauce, hummus, or couscous.

## DID YOU KNOW?

Kebab or kebob is a Middle Eastern meat dish typically cooked on a skewer over a grill or fire. Popular variations include *shish kebab* and *doner kebab* (with bread). Kebab meat is usually lamb, but regional variations include beef, goat, chicken, fish, and pork.



# Bill Ryzniczuk

CULINARY RESEARCH TECHNICIAN

Bill's work at Prairie Research Kitchen draws on extensive food science knowledge and an impressive set of innovative culinary skills.

He's a graduate of the Food Science program at the University of Manitoba, the Culinary Arts program at RRC Polytech, and the Meat Processing program at Olds College. He also has 15 years of experience in the food retail, service, and manufacturing industries.

Bill chose this recipe because it perfectly demonstrates how PRK's skilled chefs drive innovation through culinary knowledge and techniques while supporting the food industry's drive to identify new applications for pulses, grains, and other crops.

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I've enjoyed working with a variety of food industries to explore ways to define the quality of their products. The challenges I've faced range from characterizing everything from the texture of fried chicken and the flavour of a poppy seed to the colour of a mayonnaise." **BILL RYZNICZUK**



**FUN FACT** Thanks to his background in meat processing, Bill cures his own ham, bacon, and sausage at home. He also keeps his coworkers informed about weekly grocery deals.

# Beef and Bean Cabbage Rolls

Source: Pulse Canada Food Service Project

YIELD: 24 ROLLS/1 HOTEL PAN

## FILLING

1 kg	beef and navy bean blend (75% beef/25% mashed navy beans)
1 kg	navy beans, cooked to Level 2 doneness (See Pulse Canada Project, Chapter 2)
340 g	onion, medium dice
40 g	garlic, minced
500 g	water
18 g	salt
6 g	caraway seeds
2.4 g	nutmeg

## SAUCE

3.38 kg	canned tomatoes, diced
8	bay leaves
8	sprigs thyme, fresh
340 g	onion, small dice
584 g	red bell pepper, small dice
24 g	paprika
40 g	garlic, minced
16 g	salt
14 g	pepper, ground
24	bacon strips
24	cabbage leaves

**DID YOU KNOW?** Few foods say Manitoba better than cabbage rolls. Cabbage rolls are common to a variety of cuisines from around the world, including Europe, Asia, and Africa. Ukrainian *holubtsi* are both a national favourite in Ukraine and in Manitoba, home to a proud and vibrant Ukrainian community. In 2022, more than 13 per cent of Manitobans claimed Ukrainian ancestry, well over the 3.6 per cent national average.

## Filling

1. Sauté the onion and garlic over medium heat without developing any colour.
2. Add the beef and navy bean blend and sauté until the bottom of the pan begins to brown lightly.
3. Add the cooked navy beans, water, caraway seed, salt, and pepper, and bring to a simmer.
4. Simmer on low heat until the filling becomes thick and no water remains in the pan.

## Sauce

1. Sauté the onion and pepper over medium heat without developing any colour.
2. Add the diced tomatoes, paprika, garlic salt, pepper, thyme sprigs, and bay leaves. Stir until combined.
3. Simmer the sauce over low heat until the sauce begins to thicken and the tomatoes and onions start to break down.
4. Remove the thyme sprigs and the bay leaves. Reserve the sauce to put overtop the cabbage rolls before baking.

## Cabbage leaves

1. Blanch a whole head of cabbage in simmering water and gently remove the outer leaves as they become loose. Take care not to rip or damage the leaves.
2. Allow the leaves to cool until they can be handled.

## Assembly

1. Place 120 g of filling on the round end of the cabbage leaf, tuck in the sides, and roll tightly to form a tight cabbage roll.
2. Repeat until all the cabbage rolls are filled.
3. Fill a hotel pan with a single layer of cabbage rolls and cover with the sauce.
4. Layer strips of bacon overtop the cabbage rolls.
5. Bake in a 375°F oven for 1 hour.

Dice and brown the cooked bacon to garnish the cabbage rolls.



**FUN FACT** Branden has been building terrariums for various species of carnivorous plants as a hobby since the start of the COVID-19 pandemic. He also competes in dog sports with his two dogs: Molly, a 6-year-old beagle/terrier mix, and Maverick, a 4-year-old European beagle.

# Branden Wryha

RESEARCH TECHNICIAN

Branden serves as a connector between Prairie Research Kitchen and RRC Polytech's Life Sciences Department, where he previously worked as an educational assistant.

He graduated from RRC Polytech's Chemical and Bioscience Technology co-op program in 2014 and later obtained his BSc from the University of Winnipeg. He came to PRK after more than five years working in government and commercial laboratories, where he gained valuable experience in laboratory equipment, safety, and research.

The meatloaf recipe he shares here is a favourite, and frequently requested, dinner choice at home.

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Having the ability to drive impact in the world of research, and holding a rewarding career with my alma mater, has been a primary highlight of my experience at Prairie Research Kitchen."

BRANDEN WRYHA



# Meatloaf

Source: *The Barefoot Contessa*

2 tbsp	good olive oil
2 cups	Spanish onion (1 large), chopped
1 1/2 cups	celery (2 stalks), small-diced
1 lb	ground beef
1 lb	ground veal
1 lb	ground pork
1 tbsp	fresh flat-leaf parsley, chopped
1 tbsp	fresh thyme leaves, chopped
1 tbsp	fresh chives, chopped
3	extra-large eggs, lightly beaten
2/3 cup	whole milk
2 tbsp	kosher salt
1 tbsp	black pepper, freshly ground
2 1/2 cups	panko crumbs

## GARLIC SAUCE

3/4 cup	good olive oil
10 cloves	garlic, peeled
2 cups	chicken stock, preferably homemade
3 tbsp	unsalted butter, at room temperature
Kosher salt and freshly ground black pepper	

1. Preheat the oven to 350°F.
2. Heat the olive oil in a large (12-inch) sauté pan over medium heat. Add the onion and celery and cook for 5-7 minutes, stirring occasionally, until the onion is translucent but not browned. Set aside to cool slightly.
3. Place the beef, veal, pork, parsley, thyme, chives, eggs, milk, salt, and pepper in a large mixing bowl. Put the panko in a food processor fitted with a steel blade and process until the panko is finely ground. Add the onion mixture and the panko to the meat mixture. With clean hands, gently toss the mixture together, making sure it's combined but not compacted.
4. Place a piece of parchment paper on a sheet pan. Pat the meat into a flat rectangle and then press the sides in until it forms a cylinder down the middle of the pan (this will ensure no air pockets). Bake for 40-50 minutes, until a thermometer inserted in the middle reads 155-160°F. Remove from the oven and allow to rest for 10 minutes. Slice and serve hot with the garlic sauce.

## Garlic sauce

1. Combine the oil and garlic in a small saucepan and bring to a boil. Lower the heat and simmer for 10-15 minutes, until lightly browned. Be careful not to burn the garlic or it will taste bitter. Remove the garlic from the oil and set aside (I save the oil for vinaigrettes).
2. Combine the chicken stock, butter, and cooked garlic in a medium saucepan and bring to a boil. Lower the heat and cook at a full boil for 35-40 minutes, until slightly thickened. Mash the garlic with a fork, whisk in 1/2 tsp salt and 1/4 tsp pepper, and taste for seasonings. Spoon the warm sauce over the meatloaf.





# Elena Gomez Haro Aceves

RESEARCH MANAGER

Elena has helped develop over 20 products from inception to market throughout her career, including corn-and-tortilla-based products for PepsiCo Mexico, and ice cream and frozen dessert products for Prairie West Ice Cream.

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I'm inspired daily by the expertise, passion, and hands-on problem-solving mindset of the chefs I work with. I value working for an institution that respects equality, diversity, and inclusion."

ELENA GOMEZ HARO ACEVES

She brings a powerful combination of skills and experience to Prairie Research Kitchen, including 15-plus years in innovation, research and development, quality assurance, and marketing in the academic, food, and plant science sectors. These ingredients make her especially effective at finding solutions for our clients and collaborating with our food research and development centre partners. She holds an MSc in Food Science from the University of Manitoba.

She chose this recipe for its warmth and simplicity, balanced flavour, and creamy texture. "The aroma is like a trip home or to a beautiful place," she says. "Plus, this recipe was developed by a great student (Michael Luay) working with a great chef (Norm Pastorin), so it's a fine example of what our skills can achieve for clients."

**FUN FACT** Elena recently became Canadian, and although she's very proud of her Mexican origins, she embraces and loves her new country.

# Roasted Carrot and Ginger Soup with Chili Crisp

Source: Richardson Student-led Recipe Project

YIELD: 2.5 L (10 SERVINGS) OF SOUP, 120 ML OF CHILI CRISP

## CHILI CRISP

6 cloves	garlic, peeled, thinly sliced
1 tbsp	ginger, medium dice
1	small shallot, thinly sliced
1/2 cup	canola oil
1 tsp	kosher salt
1/8 tsp	black pepper, ground
1 tsp	sugar
1 tsp	Sichuan peppercorns, ground
1	star anise, whole
1 cup	whole dried chiles
1/4 tsp	cumin, ground

## ROASTED CARROT AND GINGER SOUP

6	medium carrots, peeled, medium dice
1/2 cup	canola oil, divided
4 tsp	kosher salt, divided
1 tsp	black pepper, ground
1	medium onion, medium dice
1/3 cup	ginger, peeled, medium dice
8 cups	vegetable broth
1/2 cup	heavy cream

**NOTE** Onions can be substituted for shallots. Substitute coconut milk for heavy cream to make this recipe vegan and dairy-free.

## Chili Crisp

1. Place the whole dried chiles in a spice grinder and grind on high to obtain a coarse flake size, about 5 seconds.
2. In a small pot, heat the oil to 350°F.
3. Line two heat-proof plates with paper towels.
4. Place the shallots in hot oil and fry until crispy and golden brown, about 45 seconds. (Be careful not to burn them.)
5. Strain the shallots over a heatproof container, place the oil back into the pot, and transfer the shallots onto a paper-towel-lined plate.
6. Repeat with the sliced garlic.
7. Place the oil back into the small pot and heat to 350°F. While your oil is heating back up, combine all the spices and ginger in a heat-proof bowl and mix well.
8. Once the oil is hot, pour it over the spice and ginger mix and mix carefully, as the oil is very hot.
9. Cool the oil mixture. Add the fried shallots and fried garlic.

## Roasted Carrot and Ginger Soup

1. Preheat the oven to 400°F.
2. Place the carrots into a large bowl, toss with half the canola oil, half of the salt, and pepper to coat.
3. Place the seasoned carrots onto a parchment-lined baking sheet.
4. Roast the carrots for 30 minutes, mixing every 10 minutes.
5. In a medium pot, heat the remaining oil over medium heat.
6. Once the oil is hot, add the chopped onions and cook, stirring occasionally until they become translucent, about 1 minute.
7. Add the vegetable broth and diced ginger and bring to a simmer for 10 minutes.
8. Once the carrots have been roasted, add them to the simmering pot and simmer for another 20 minutes over low heat.
9. Stir in the heavy cream and remaining salt.
10. Transfer the hot soup to a blender, and blend on high until smooth for 2 minutes. Do this in multiple batches if the blender is too full.
11. Transfer the soup back into the pot and bring to a low simmer.

Ladle 1 cup of the soup and garnish with 1 tbsp of chili crisp.



# Heather Hill

RESEARCH MANAGER

Heather joined Prairie Research Kitchen in 2018. She has an extensive background in food science and the pulse industry, where she promoted the increased use of beans and peas as food ingredients.

“What drew me to this field was the realization that food connects everyone, everywhere,” she says. At PRK, she applies her expertise in novel ingredient development to a range of agri-food products and supports the innovation efforts of our clients and partners.

Working with organizations such as Pulse Canada and Cereals Canada opened her eyes to how industry innovation here in Canada was driving popularity for pulses worldwide as an alternative protein source and a value-added ingredient. In addition to publishing numerous papers on pulses and novel food ingredients, Heather contributed a chapter on dry beans and other pulses as ingredients in food products in *Dry Beans and Pulses: Production, Processing, and Nutrition* (Wiley, 2021).

**FUN FACT** Heather loves exploring nature with her family - so much so that she conducts meal planning and recipe testing ahead of time to maximize their time outdoors and minimize food prep.

Heather shares a simple, hearty soup she enjoyed in Istanbul - an experience that opened her eyes (and taste buds) to the possibilities of pulses as food ingredients. This recipe was the closest she could find to a soup she savoured in a certain small resto café outside the Blue Mosque.

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I love being part of the excitement and passion that food entrepreneurs have for their products and brands!” **HEATHER HILL**

# Turkish Red Lentil "Bride" Soup

Source: Geneviva Jensen

YIELD: 4 SERVINGS

1/4 cup	butter
2	onions, finely chopped
1 tsp	paprika
1 cup	red lentils
1/2 cup	fine bulgur
2 tbsp	tomato paste
8 cups	vegetable stock
1/3 tsp	cayenne pepper
1 tbsp	dried mint leaves
4 slices	lemon
1/2 tsp	fresh mint, chopped

1. Melt the butter in a large saucepan over low heat. Cook the onions in the hot butter until they are golden brown, about 15 minutes.
2. Stir the paprika, lentils, and bulgur into the onions and coat with the butter.
3. Add the tomato paste, vegetable stock, and cayenne pepper; bring to a boil and cook until soft and creamy, about 1 hour.
4. Crumble the dried mint leaves into the soup; stir the soup and remove from heat.

Ladle into bowls and garnish with lemon slices and fresh mint to serve.





# Jamie Chahine

INDIGENOUS RESEARCH LIAISON

Jamie is dedicated to opening avenues for Indigenous learners to participate and innovate in the food industry.

By connecting Indigenous clients and students with Prairie Research Kitchen researchers, she has helped create new opportunities for economic reconciliation and knowledge transfer that benefit communities, businesses, and industry.

Jamie is Métis from Winnipeg, and joined PRK in 2021 after 11 years developing Indigenous advancement opportunities and delivering supports and post-secondary education services for First Nations, Métis, and Inuit students at RRC Polytech. She also has over 15 years of experience in business finance and administration.

**FUN FACT** Jamie loves spending time in the forest, on the water, or hitting the road on a spontaneous road trip.

Jamie chose this recipe because it tastes great, can be prepared in advance, and is created from simple, accessible ingredients. “The most rewarding projects at PRK create learning opportunities for our students, while applying the scientific, culinary, and technological skills of our expert team to achieve the goals of our clients,” she says. “This appetizer is a delicious memory of one particular student-led recipe development research project.”

“

Working with Prairie Research Kitchen’s talented culinary and food science experts has shown me how committed they are to sharing knowledge, expertise, research innovation, and technology with Indigenous learners and entrepreneurs. The PRK team has a sincere, ongoing commitment to allyship, and continues to build meaningful opportunities for Indigenous learners and clients to achieve their research priorities.” **JAMIE CHAHINE**

# Pinto Bean and Garlic Parmesan Stuffed Mushrooms

Source: The Stak Co. Recipe Development Project

YIELD: 20 MUSHROOMS (4 SERVINGS OF 5 MUSHROOMS)

20 each	white button mushrooms, stemmed
1/4 cups	olive oil, extra virgin
1 1/4 cups	pinto beans, cooked
1/3 cups	cream cheese, softened
2 tbsp	parmesan, grated
1 1/2 tsp	garlic, minced
1 1/2 tsp	parsley, minced
1 1/2 tsp	unsalted butter, melted
1/4 cups	panko breadcrumbs
1/8 tsp	black pepper
1/4 tsp	salt

**NOTE** This recipe can be assembled ahead of time and baked the following day.

1. Preheat the oven to 204°C/400°F.
2. Toss the mushrooms with olive oil until the oil is absorbed.
3. Lightly season with salt and pepper, then bake the mushrooms, right-side-up, on a lined sheet pan for 10 minutes. Remove the mushrooms from the oven and allow to cool.
4. While the mushrooms are cooling, coarsely mash the beans in a bowl with a fork.
5. To the bowl, add the cream cheese, parmesan, garlic, salt, black pepper, half the parsley, and half the breadcrumbs. Mix until combined.
6. In a separate bowl, mix the melted butter with the remaining breadcrumbs and parsley and a pinch of salt, then set aside.
7. Spoon 1/2 tbsp of filling into each mushroom cap, then top with a sprinkle of buttered breadcrumbs.
8. Bake on a parchment-lined sheet pan for 16 minutes or until tops are golden brown.





#### FUN FACT

When Judy isn't at work, she can be found training or competing in triathlons and marathons.

# Judy Quistberg

## ADMINISTRATIVE ASSISTANT

Working at Prairie Research Kitchen has been a learning experience for Judy, who joined our team after 30 years working in health care and corrections administration.

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Over the past five years, I've seen this team grow into a cohesive problem-solving machine."

JUDY QUISTBERG

She enjoys the diversity of the projects she's been involved in, and loves watching the PRK team come up with innovative and tasty solutions to each new challenge. Judy is a master at keeping projects moving through their various stages, which is no small task at such a large post-secondary institution.

Judy's recipe is a family favourite her grandmother used to make over a woodstove. She would top it with her homemade blueberry or crabapple jelly, and lots of butter. "Just the smell brings me back to her kitchen," she says.



# Norwegian Lefse

2 1/2 lbs	russet potatoes, peeled
1 stick	butter, at room temperature
1/2 cup	heavy cream
1 tsp	salt
1 cup	all-purpose flour

**DID YOU KNOW?** Lefse is a traditional soft Norwegian flatbread made from potatoes. It's especially popular around holidays like Thanksgiving or Christmas. Fargo, North Dakota hosts a popular Lutefisk and Lefse Festival each year in August.

1. Simmer the potatoes for 45 minutes or until tender all the way through. Strain and put them through a ricer.
2. Combine the butter and potatoes well, keeping the mixture light and fluffy. Let the mixture sit on the counter for 1 hour and then refrigerate overnight. Mix the potatoes with cream, flour, and salt, and form the mixture into a ball.
3. Divide the mixture into 8 sections, form into balls, and refrigerate again. Preheat a grill/griddle to 500°C.
4. Form each of the 8 balls into a disk by hand.
5. Roll out each ball on a floured cloth mat using enough flour to ensure that it doesn't stick. Traditionally, a long stick would be used to lift and fold the dough before cooking.
6. Cook on each side for approximately 1 1/2 minutes.

Cool and serve with the topping of your choice. You may also roll the dough into a crêpe-like shape if desired. (We always just folded them into quarters and ate them with butter.)





# Kyle Andreassen

RESEARCH CHEF

Kyle has food production baked into him. His grandfather and father were bakers, and Kyle grew up on the production floor of a small-town bakery.

He joined Prairie Research Kitchen in 2017 after spending more than 10 years in the restaurant industry, honing his skills across Canada and in Australia. He credits the talented mentors he's worked with at PRK for shaping him into a chef grounded in food science principals.

We do a lot of plant-based cooking here at PRK, and Kyle loves the challenge of replacing meat in a recipe - especially when the result tastes better than the original. "These taquitos are flavourful, spicy, and, in my opinion, tastier than if you used beef," he says about the recipe he shares here. "Who says tofu doesn't taste like anything?"

**FUN FACT** Kyle is an avid home brewer, and the skills he's gained at PRK have transferred over to his beer-making processes. The observation and data collection from his beer production is as detailed as his office and research kitchen records.

“

When I was hired in 2017, I had never scaled up a recipe to a large size because that wasn't typically required in restaurants. I used to think that any recipe producing a batch size of more than 50 kg was huge. A favourite highlight was seeing my first bench formulation successfully scaled from 1 kg to full production size at the client facility. Seeing a bench formulation come to life is as exciting now as it was five years ago." **KYLE ANDREASEN**

# Tofu Taquitos Using Dehydrated Fava or Soy Tofu Crumble

Source: Canadian Agricultural Partnership (CAP) Project

YIELD: 6 TAQUITOS

## DEHYDRATED FAVA OR SOY TOFU

1 lb fava or soy tofu, firm

## TOFU TAQUITOS

1/2 cup fava or soy tofu, hydrated crumbles

1/4 cup water, hot (95°C)

1 tsp canola oil

1 tbsp onion, minced

1 tsp garlic, minced

1/2 tsp cumin

1/4 tsp paprika

1/4 tsp coriander

1 whole chipotle pepper, minced

2 tsp adobo sauce

1/2 tsp salt

1/2 cup mozzarella, grated

6 corn tortillas

## Dehydrated Tofu

1. Freeze the tofu until solid.
2. Thaw the tofu and drain off all excess water.
3. Crumble the tofu into pea-sized crumbles. Using a dehydrator, dehydrate the crumbles at 63°C/145°F for 10-12 hours until all crumbles are completely dry.
4. Store in an airtight container.

**CHEF'S NOTE** The goal of this process is to create a meat-like texture for the tofu. Although there are commercial methods to accomplish this, the easiest way to create a consistent product at home is to dry the tofu completely, then add water back in the first step below.

## Tofu Taquito

1. In a small bowl, add hot (simmering) water to the dehydrated tofu crumbles, cover with plastic wrap, and allow to sit for 5 minutes. Drain excess water.
2. In a separate small bowl, combine all seasonings and spices.
3. In a sauté pan over medium heat, add oil. Once the oil is hot, add the onion and sauté for 1 minute. Add the garlic, seasoning mix, chopped chipotle and adobo sauce. Sauté for 1 more minute and then add the hydrated tofu.
4. Sauté the tofu mixture for 1-2 minutes until hot and just starting to get brown, crispy edges. Adjust seasoning as desired.

5. Remove the mixture from heat and pour it into a bowl to cool for 5-10 minutes. It should be cool enough that the cheese doesn't melt when you mix it in.
6. Add the grated mozzarella to the slightly cooled tofu mixture and stir until well combined. You may want to add 1-2 tsp of water to moisten the mixture. You should be able to form it with your hand so that it doesn't fall out of the shell during the filling/rolling step.
7. Heat the oven to 400°F. Using a non-stick skillet over high heat, add 1-2 tsp of oil. Once the oil is hot, gently lay in 1 corn tortilla for about 5 seconds, then flip. Swirl the skillet to coat the tortilla with the hot oil. This helps soften the tortilla for easier rolling and crisping up during the baking process. You may need to add more oil as it coats the shells.
8. Carefully remove the tortilla and add 1/6 (or the desired amount) of the filling to the bottom third of the tortilla. Tightly roll up the taquito and place on a parchment-lined sheet pan, seal side down. You may need to use a toothpick to seal it if the taquito rolls open on its own.
9. Repeat until all the filling is used up.
10. Bake for 10-12 minutes until edges are crispy and cheese is melty.

Serve with sour cream and fresh salsa.

**NOTE** Adjust the amount of cheese as desired. For added flavour, bulk, and nutrition, add minced green peppers and mushrooms to your sauté mix before filling.



# Mavis McRae

DIRECTOR

Mavis is the founding Director of RRC Polytech's Culinary Research program, which started in 2014.

With a 25-year career in food product development and project management, her connections to Western Canadian food and agriculture stakeholders have proven critical in creating successful collaborations between Prairie Research Kitchen and its clients.

Armed with a BSc in Food Science and an MBA from the University of Manitoba, and drawing on her experience working for organizations such as Food Development Centre and the Industrial Research Assistance Program (IRAP), she helps new PRK clients navigate the commercialization process and links them up to other valuable technical and business resources in the community.

The recipe she shares here is one of the first big projects the culinary research team undertook in the early days of the program. "It was my first time working with a chef. I had no idea what I was going to get when I asked him to be creative with pulse flours. I wasn't expecting a perogy, but that was exactly the creativity I was *hoping* for."

**FUN FACT** Growing food and avoiding food waste keep Mavis busy in the kitchen, especially when the garden has a good year. When not immersed in food, she can be found immersed in water, scuba diving in tropical locations.

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Completing our kitchen on the eleventh floor in 2019 was a huge highlight and a relief. It was the largest construction project I had even been involved with, and it was stressful. Having a beautiful, functional home for the team to work together with clients and students makes me smile." **MAVIS MCRAE**

# Cheese and Garlic Perogies Using Navy Bean Flour

Source: Manitoba Pulse and Soy Growers Project

YIELD: 6 DOZEN PEROGIES

## DOUGH

1	egg, large
5 ml	salt
100 ml	water
250 ml	sour cream
750 ml	all-purpose flour
230 ml	navy bean flour (or, for a unique colour, use black bean flour)

## FILLING

5	potatoes, russet, peeled and cut in half lengthwise
100 g each	smoked gouda, jalapeño jack, and cheddar mild cheese, grated fine
1 bulb	garlic, large, cloves peeled and brushed with vegetable oil and roasted until golden brown
100 g	butter
250 ml	whipping cream
6	egg whites, whisked
Salt and pepper to taste	

## Dough

1. Add wet ingredients to dry. Add a bit more water if necessary.
2. Knead the dough for 3-4 minutes.
3. Place the dough in a bowl, cover tightly, and refrigerate for 1/2 an hour to rest.

## Filling

1. Place the russet potatoes in a rice cooker/steamer or in a pot of lightly salted cold water. Steam the potatoes until tender enough to mash or bring the pot of water to a boil and cook the potatoes to mash tender.
2. In a separate pot, add the butter, cream and mashed roasted garlic and heat to a simmer.
3. Mash the potatoes (or run them through a food mill for best results) with the 3 grated cheeses. Add the heated cream mixture and season with salt/pepper to taste. Mix until just combined and chill uncovered in the fridge.
4. Using a bench scraper (or knife) cut a 1/4 piece of the dough off and roll to approximately 1/16 inch thick. Cut rings out using a 2-inch pastry ring cutter. Lay the "floury" side facing up. Brush generously with the whisked egg whites. Place approximately 1/2 tbsp of filling into the circle, fold over, and press to seal. Crimp with a fork if you desire. Repeat until all the filling and dough is used.
5. Bring a pot of lightly salted water to a boil and cook the perogies in batches until they float to the surface. Remove and serve immediately or cool down in water, draining well. If you want to freeze them, toss with generous amounts of vegetable oil to prevent sticking. If you want to eat them right away, pan fry them in margarine or butter.

Serve with sour cream or kick it up a bit by adding equal parts salsa to the sour cream.

**DID YOU KNOW?** *Perogy, pierogi, pirogge, varenyky* - call it what you will, we associate them most often with Slavic cuisine. In fact, the perogy most likely originated in China, reaching Europe during the Middle Ages and gaining popularity thanks to Marco Polo's expeditions along the Silk Road. They come in endless varieties and fillings, including potatoes, onions, cheese, cabbage, sauerkraut, meat, mushrooms, and spinach. They were first brought to North America by Eastern European immigrants. Thanks to Canada's (and Manitoba's) large Polish and Ukrainian populations, they have become a familiar favourite available in most grocery stores. As our recipe demonstrates, perogies are anything but boring.

# Norman Pastorin

## CULINARY RESEARCH TECHNICIAN

Norman came late to the culinary world after earning a degree in business.

He got his start apprenticing under Chef Takashi Murakami (C.M.) at the St. Charles Country Club, where he worked for five years as a junior sous chef. Not long after that, he launched the next stage of his culinary career designing, creating, and opening exciting new restaurants such as Fazzo Bistro, the Grove Pub and Restaurant, the Cornerstone Bar and Restaurant, and the Black Bird Brasserie. When the COVID-19 pandemic forced many of his restaurants to close, Norm joined RRC Polytech as a Culinary Arts instructor before joining PRK as a culinary research technician.

### FUN FACT

Norman started skateboarding at age 41. Boarding has since become a source of joy, stress relief, and fitness.

Norman chose to share this recipe for Persian Chicken with Tahdig because of the revelatory experience he had while developing it. "I had never tried Persian food before, but after working on this recipe with one of our students, I was introduced to new flavour combinations that I absolutely loved."



//

A highlight for me was learning about Sensory Evaluation (SE), which occurs throughout the food industry in a variety of ways. I was tasked with creating an SE training program for the Culinary Arts instructors to establish a trained tasting panel that could be called upon in the future to conduct sensory evaluation on food products developed in PRK." **NORMAN PASTORIN**

# Persian Chicken with Tahdig

Source: Richardson Student-led Recipe Development Project

YIELD: 4 PORTIONS

## CHICKEN MARINADE

2 each	chicken thighs and drumsticks
4 tbsp	vegetable oil
2 tsp	turmeric
1 tsp	salt
1/4 tsp	paprika
1/4 tsp	cayenne pepper
1/4 tsp	allspice
1/2 tsp	black pepper, ground
1 clove	garlic, minced
1 tbsp	honey
Juice from 1	lemon, fresh
1/4 tsp	cinnamon

## TAHDIG

1 tsp	saffron threads
1 cup	basmati rice
2 tbsp	yogurt
1 tbsp	vegetable oil
1/2 cup	golden raisins
Zest from 1	orange
1/4 tsp	cinnamon
1 tbsp	spread
1/2 cup	spread, melted
3 tbsp	kosher salt, for rice
8 cups	water

**NOTE** You can substitute the golden raisins with any dried fruit.

**DID YOU KNOW?** Tahdig means “bottom of the pot” in Persian, and describes pan-fried rice with a delicious, crunchy, golden crust on the outside and fluffy, buttery rice on the inside.

## Persian Chicken

1. Add all the ingredients to a mixing bowl and mix to combine.
2. Store in a refrigerator and marinate for 30 minutes. Prepare the tahdig.
3. On a parchment-lined sheet pan, roast the chicken in an oven at 350°F until the internal temperature reaches 165°F.
4. Remove and cool for plating.

## Tahdig

1. In a medium-sized pot, bring the 8 cups of water to a boil and add 3 tbsp of salt.
2. Pour in the basmati rice and boil for 7 minutes.
3. Remove the pot from the heat and strain out the rice.
4. In a mixing bowl, combine the yogurt, cinnamon, and 1/2 of the boiled rice.
5. Combine the remainder of the rice in a separate bowl with the orange zest.
6. In a non-stick pot, layer on the rice and yogurt mixture. Place on low heat just enough to hear the pot sizzle lightly.
7. Once sizzling, first layer on golden raisins and then the orange zest rice mixture. Rub the spread on the inside of the pot to prevent it from sticking.
8. Place a tea towel on the lid and tie it on the top. Place it over the pot to capture excess steam.
9. Cook until the rice is al dente, about 5-10 minutes.
10. Once the rice is cooked, remove the lid and pour the melted spread over the rice.
11. Cover with a serving plate and flip the pot, transferring the tahdig onto the serving plate.

Serve hot with the Persian chicken.



# Roxanne Kent

CULINARY RESEARCH ASSISTANT

Roxanne Kent joined Prairie Research Kitchen in 2021, and now puts her culinary skills to work supporting product development projects.

She has won various awards, including one for a recipe she developed for Manitoba Pork Producers. Since coming to PRK, she worked on several product development projects highlighting Indigenous and local ingredients.

Community connection is especially important to Roxanne: in addition to graduating from RRC Polytech's Culinary Arts program in 2021 with honours, she earned a social work degree in 2015. One of her long-term goals is to work with low-income families to teach them how to cook nutritious meals.

Roxanne also takes the lead on redirecting excess food from PRK projects by donating them to community organizations such as the Main Street Project, a local community organization serving Winnipeg's most vulnerable residents. She was first introduced to PRK's focus on sustainability and community support while working on a project for Winnipeg Harvest (now Harvest Manitoba, a province-wide food bank network), where she dehydrated excess veggies for a shelf-stable packaged soup.

Her recipe for Scotch eggs incorporates beans as an alternative protein. The challenge, she says, was to give the beans a sausage flavour that tastes just like the real deal.

**FUN FACT** When Roxanne first started culinary school, she had no kitchen experience, let alone *research* kitchen experience. RRC Polytech's Culinary Arts program allowed her to explore both and gave her the confidence to follow her goals.

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I'm especially proud of the wild blueberry sauce I created for Prairie Research Kitchen. This was an opportunity to hone my product development skills and an exciting challenge because I wanted to use sweetgrass. With the help of my research coordinator, I created a sweetgrass-infused vinegar to enhance the flavour of the sauce."

ROXANNE KENT



# Sausage-Free Scotch Eggs

Source: Pulse Canada Food Service Project

YIELD: 12 EGGS

600 g	pinto beans, cooked
2 g	mustard powder
20 g	brown sugar
2 g	paprika, smoked
1 g	sage, ground
.5 g	thyme, ground
6 g	fennel seed
8 g	kosher salt
2 g	ground pepper
2	eggs, whisked

## HERB BUTTER

20 g	butter, unsalted
15 g	onions, minced
10 g	garlic, minced
50 g	butter, unsalted
10 g	parsley
12	eggs, soft boiled
200 g	all-purpose flour
200 g	panko crumbs
350 g	egg wash

**DID YOU KNOW?** A traditional Scotch egg is traditionally wrapped in sausage meat instead of our bean mixture. A common picnic food, in the United Kingdom Scotch eggs are even packaged and sold in grocery stores, corner stores, and quick marts. In North America, you'll most often find them in British-styled pubs.

Scholars debate the origins of the Scotch egg, and many people have claimed to be its inventor. Some say they're called "Scotch" eggs because they were originally "scorched" over an open flame, although records suggest otherwise. Others claim the name comes from the "Scotching" culinary process, although the process itself is open to interpretation. Still others point to the 19th century Scottish practice of dipping eggs in lime powder to prepare them for trade.

1. Mash the pinto beans with a fork.
2. Mix the spices and add them to the pinto bean mix.
3. Stir in the herb butter and let the mixture cool completely.
4. Add in the whisked egg and mix well.
5. Chill the mixture.

## Herb Butter

1. In a medium saucepan on medium heat, add a small amount of butter and sauté the onion and garlic until the onions are soft.
2. Add in the remaining butter and melt.
3. Add in the parsley and take the herb butter off the heat to cool.
4. Once cool, add the herb butter to the bean mixture.

## Soft Boiled Eggs

1. Place 12 eggs in a large pot of water.
2. Bring the water to a boil, then simmer for 5 minutes.
3. Turn the heat off and place the eggs in an ice water bath for 2 minutes.
4. Carefully peel the eggs and dry them off. Set them aside until you are ready to wrap the eggs in the bean mixture.

## Wrapping the Eggs

1. Preheat the oil for deep frying to 165°C/325°F.
2. Prepare your egg dredging station. Put the flour, panko crumbs and egg wash in separate bowls.
3. Weigh out 50 g of the chilled bean mixture.
4. Put a portion of the mixture onto the palm of your hand. Place the egg on top. Carefully add the remaining mixture and wrap it around the egg, filling any gaps in the coating. The egg should be completely covered in bean mixture with no part of the egg showing.
5. Repeat this step with the remaining soft boiled eggs.
6. When completed, put the bean-covered eggs in the flour, then in the egg wash, then in the panko crumbs. Put the egg in the egg wash again, then in the panko crumbs again, for a double dredge. Repeat with remaining eggs.
7. Deep fry the eggs for 2 1/2 minutes or until the eggs are golden brown.



# Samantha (Sam) Owsianski

INDUSTRY LIAISON MANAGER,  
RESEARCH PARTNERSHIPS &  
INNOVATION (RPI), RRC POLYTECH

Sam's role connects industry with RRC Polytech's Technology Access Centres and other research programs, including Prairie Research Kitchen and the Culinary Research team.

She helps forge partnerships that provide companies with access to our facilities, equipment, and expertise, including staff, faculty, and students - resources that are vital to helping members of the food industry overcome innovation challenges. These partnerships also create opportunities for students to gain exposure to real-world technical challenges while building relationships with potential employers.

Sam plays a critical role sourcing funding from government and not-for-profit partners to support the costs surrounding PRK projects. She is an RRC Polytech grad and has a background working in trade, the start-up community, and economic development in Manitoba.

The recipe Sam chose to share is for her favourite veggie burgers. Her partner makes them in the air fryer, and she loves everything that goes into them: sweet potatoes, quinoa, black beans, and especially cilantro.

**FUN FACT** Sam is an avid gardener. She's mostly drawn to flowers but aims to up her vegetable game. She's also a jogger and hopes to run a marathon someday.

//

I learn something new about food every chance I work with the PRK team. I particularly admire their food pun abilities in the group chat. They are a fun and smart group of researchers."

SAMANTHA (SAM) OWSIANSKI

# Favourite Veggie Burgers

Source: cookieandcake.com

YIELD: 8 BURGER PATTIES

1 1/2 lbs sweet potatoes  
(2 medium or 3 small)

1/2 cup quinoa, rinsed in a  
fine-mesh colander

1 cup water

1 can (15 oz) black beans, rinsed  
and drained (or 1 1/2  
cups cooked black beans)

1/2 cup chopped red onion  
(about 1/2 small red onion)

1/3 cup chopped fresh cilantro

2 cloves garlic, pressed or minced

2 tbsps adobo sauce or  
2 tsp smoked paprika

2 tsp ground cumin

1 tsp chili powder

1/2 tsp salt

1 1/4 cups quick-cooking oats (use  
certified gluten-free  
oats if necessary)

Extra-virgin olive oil, for brushing (or  
avocado oil, if using stovetop method)

8 whole wheat hamburger  
buns (optional)

Your favourite burger fixings:

avocado or guacamole, tomato, onion,  
lettuce, pickles, cheese, sprouts, ketchup,  
hot sauce, mustard, fried eggs...



1. Preheat the oven to 400°F. Line a large baking sheet with parchment paper.
2. Slice the sweet potatoes down the centre lengthwise. Place the sweet potatoes cut-side down on the prepared baking sheet. Roast until they yield to a gentle squeeze, 30-40 minutes or longer. Set aside. (If you're baking the burgers, reserve the parchment-lined pan and leave the oven on.)
3. In a small saucepan, combine the quinoa and water. Bring the mixture to a boil over medium-high heat, then reduce the heat to maintain a gentle simmer. Simmer uncovered until all the water is absorbed, 11-14 minutes. Remove the pan from the heat, cover, and let the quinoa steam for 10 minutes.
4. Once the sweet potatoes are cool enough to handle, remove and discard the skin and roughly chop the insides. In a large mixing bowl or the bowl of your electric mixer, combine the cooled sweet potatoes and quinoa, black beans, onion, cilantro, garlic, adobo sauce, cumin, chili powder, and salt. Use a potato masher, pastry cutter, large spoon, or the paddle attachment of your mixer to mix well. It's okay if the black beans get smashed in the process.
5. Sprinkle the oats over the mixture and mix well with a large spoon until the mixture holds together when you shape a portion into a patty. If you won't be making the burgers immediately, cover the mixture and refrigerate for later.
6. Use a measuring cup to measure out 1/2 cup of the mixture. Gently shape it into a patty about 3 1/2 - 4 inches in diameter. Use your hands to gently flatten the burgers and smooth out any jagged edges. Repeat the process for each patty; you should end up with 8.
7. If you're baking the burgers, brush both sides of each patty generously with olive oil and place them on the lined baking sheet, leaving a few inches of space around each one. Bake at 400°F until the patties are deeply golden on the outside, about 35 minutes, flipping halfway.

Serve burgers as desired. Leftover burgers keep well, refrigerated, for 4 days. Or freeze them in a freezer bag for up to 3 months (thaw in the microwave for about 1 minute or in a 400°F oven for 12-15 minutes, until warmed all the way through).

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Persian Chicken with Tahdig, 133  
RS2 No-Bake Nut & Raisin  
Granola Bar, 86

rice and wild rice

Persian Chicken with Tahdig, 133  
Tofu Musubi, 73  
Wild Rice Bannock, 108  
Wild Rice Buttermilk  
Pancakes, 107

RS2. See MSPrebiotic RS2

**S**

Scotch Eggs, Sausage-Free, 135  
seaweed: Tofu Musubi, 73  
sesame oil

BBQ Tofu Steam Buns, 43  
Summer Rolls with Tamarind  
Sauce, 82

shrimp: Grilled Chili Lime Shrimp  
Skewers with Mango Salsa, 78

Siu Mai (Dumplings), 68

Soda Crackers with Fresh  
Thyme, Gluten-free, 26

soups, 105, 121-23

sour cream

Cheese and Garlic Perogies Using  
Navy Bean Flour, 131  
Tempeh Nachos with Roasted  
Corn Salsa and Lime Crema, 32

Southwest Bean Salad, 29

Soy Tofu, 40

Spaetzle, 60

Spent Grain Crêpes, 70

Spicy Fried Chicken, 62

spinach

RS2 Pesto, 84  
Summer Vegetable White Bean  
and Pesto Ragout, 102

squash

Pumpkin Lentil Muffins, 110  
Summer Vegetable White Bean  
and Pesto Ragout, 102  
Three Sisters Soup with Smoked  
Duck, 105

Steam Buns, BBQ Tofu, 43

Strawberry Cheesecake, RS2  
No-Bake, 88

sumac

Kabob Koobideh (Grilled Minced  
Meat Kabob), 113

Three Sisters Soup with Smoked  
Duck, 105

Summer Rolls with Tamarind  
Sauce, 82

Summer Vegetable White Bean and  
Pesto Ragout, 102

Sweet and Sour Berry Sauce, 98

Sweetgrass Infused Vinegar, 96

sweet potatoes

Favourite Veggie Burgers, 137  
Three Sisters Soup with Smoked  
Duck, 105

**T**

tahini

Dan Dan Noodle Bowl, 65  
RS2 Classic Hummus, 85

Tamarind Sauce, Summer Rolls  
with, 82

Tempeh Nachos with Roasted Corn  
Salsa and Lime Crema, 32

Three Sisters Soup with Smoked  
Duck, 105

tofu

BBQ Tofu Steam Buns, 43  
Gnudi, 44  
Larb, 72  
Pistachio Coconut Crème  
Pâtissière, 41  
Tofu Musubi, 73  
Tofu Taquitos Using Dehydrated  
Fava or Soy Tofu Crumble, 129  
Vegan Garlic Aioli, 45

tomatoes and tomato sauce

Beanie Joes, 50  
Beef and Bean Cabbage Rolls, 117  
Kabob Koobideh (Grilled Minced  
Meat Kabob), 113

Lemon Garlic White Bean  
Bruschetta, 101

Southwest Bean Salad, 29

Summer Vegetable White Bean  
and Pesto Ragout, 102

Tempeh Nachos with Roasted  
Corn Salsa and Lime Crema, 32

tortillas and tortilla chips

Fava Tortillas, 61

Tempeh Nachos with Roasted  
Corn Salsa and Lime Crema, 32

Tofu Taquitos Using Dehydrated  
Fava or Soy Tofu Crumble, 129

Tourtière, Bean, 51

Turkish Red Lentil “Bride” Soup, 123

**U**

Ulivit Plant Protein 2.0 Falafel, 80

**V**

veal. See beef

Vegan Alfredo Sauce, 53

Vegan Garlic Aioli, 45

vegetables (mixed). See *also* greens;  
*specific vegetables*

Bean Tourtière, 51

Beef and Bean Cabbage Rolls, 117

Biscuits and Bump, 66

Favourite Veggie Burgers, 137

Gnudi (variation), 44

Summer Rolls with Tamarind  
Sauce, 82

Summer Vegetable White Bean  
and Pesto Ragout, 102

Tempeh Nachos with Roasted  
Corn Salsa and Lime Crema, 32

Three Sisters Soup with Smoked  
Duck, 105

vinegar (white)

Juniper Berry-Infused  
Vinegar, 98  
Sweetgrass Infused Vinegar, 96

**W**

walnuts

Bean Tourtière, 51

Walnut Pesto Ragout, 102

Wild Blueberry Sauce, 96

Wild Rice Bannock, 108

Wild Rice Buttermilk Pancakes, 107









