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Should beef have a barcode?

**A look at traceability in beef
production**

Cheryl Hazenberg

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SCHOLAR PROFILE

Cheryl Hazenberg was raised on a mixed beef operation in Oakwood, Ontario. A long standing 4-H member she graduated from the University of Guelph with a diploma in Agriculture in 2002. She also has a Certificate in Event Management (Algonquin College) and is currently working on a Certificate of Business Management through the University of Calgary. After college she spent time working on dairy farms and filling contracts with Chicken Farmers of Ontario, Kemptville College and the Royal Agricultural Winter Fair.



In 2006, Cheryl moved to Alberta and began work with the Canadian Angus Association. Beginning as a member of the registry department she has worked her way up to create the position of Director of Technical Services.

Cheryl decided to apply for a Nuffield Scholarship to expand her knowledge of the international beef industry and to find a meaningful way to give back to Canadian Agriculture. An avid traveler, she has spent time in fifteen different countries in the past six years, it was a way to combine her love of travel and her love of agriculture. A continual learner, she always strives to gather as much knowledge as possible whether it is through something like Nuffield or continuing education courses.

In the spring of 2015 she moved back to Ontario to take over the family farm. Cheryl along with her sister Michelle manages the operation that raises purebred Angus cattle. They also grow cash crops and have begun a Saskatoon Berry orchard. Cheryl continues to work for the Canadian Angus Association as the Eastern Canada Manager.

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EXECUTIVE SUMMARY

Traceability. A current agriculture buzz word, especially when discussing the beef industry. As producers we are constantly told that consumers want to know more about where their food comes from. Should we use our existing national traceability system to deliver this information and how much information is too much? Narrowing down which information is important is an even greater challenge.

I have spent the last two years visiting beef exporting countries and important markets for Canadian beef to dig deeper into this subject. My studies took me to Argentina, Australia, Brazil, China, France, Hong Kong, Ireland, United Kingdom and Uruguay. I spoke with all aspects of the industry and saw many fascinating things; from consumer purchasing methods in China, full processing plant traceability in Northern Ireland to barbecue methods of South America. I learned that each culture sees beef through very different eyes. Each beef exporting country has a traceability system; export markets and the potential for disease outbreaks have demanded them. There are commonalities among the systems but each is unique. None of them are perfect, nor could they be replicated in another country with the same success. Beef production is as varied as the methods of preparing beef around the globe. There is no cookie cutter answer to these questions but we must focus on the need to continually strive to differentiate our product. Canadian beef remains a high quality niche product on the global marketplace. The industry should not try to compete on price nor should we forget that we are selling a high quality, high value product.

The majority of consumers want to know where the beef comes from and that it is safe. Period. Safe is defined by food safety legislation in each country and export product is always labeled with a country of origin. Other attributes are for most often seen in a smaller niche market centred in North America and growing in other countries.

Canada has an excellent system but I fear that we will need to amplify our efforts in the future to remain competitive. Recommendations coming from my research are:

- Enhance and expand Product of Canada guidelines and investigate the opportunity for an independent organization to oversee and promote the brand on all commodities
- Track greater data through our national traceability system and by requiring additional information such as a date of birth assigned to every tag
- Have a functional national database to trace value added data and enhance it based on specific branded beef programs needs
- As an unified industry continue to work with foodservice and retail outlets to ensure information they present to consumers is verifiable and accurate
- Enhance and expand regional Eat Local programs to encourage consumers to source local products and get to know the person behind the food

- Redesign labels on beef products and packaging to provide additional information to consumers
- Ensure beef producers in Canada understand how important traceability and consumer trust is and the keep that trust

DISCLAIMER

This report has been prepared in good faith but is not intended to be a scientific study or an academic paper. It is a collection of my current thoughts and findings on discussions, research and visits undertaken during my Nuffield Farming Scholarship.

It illustrates my thought process and my quest for improvements to my knowledge base. It is not a manual with step-by-step instructions to implement procedures.

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In submitting this report, the Scholar has agreed to Nuffield Canada publishing this material in its edited form.

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1.0 Introduction

“There is no doubt that traceability strengthens animal health as well as food quality and safety, but it will also be key to the future development” Dr. Francisco Muzio Livestock Services Director, MGAP, (Rius 2015)

Agriculture is like any other industry; we rely on a customer purchasing a product we produce. This is done time and time again thus we remain viable businesses and the industry grows. The only difference is that what we produce is a necessity of life. Canada is an affluent society and we have the luxury of having enough food, available at affordable prices. This gives many citizens the ability to make choices about what food they purchase. They can make choices based on many attributes such as:

- Fat, gluten, calorie, peanut content;
- specially produced - grass fed, cage free, no added hormone, halal harvested;
- organic or conventional;
- geography;
- added health benefits- OMEGA 3 enhanced, extra calcium;
- quality - prime, AAA, AA, tenderness;
- breed or variety;
- the specific producer or brand who produced/grew/raised the product.

There is a product for every market and every consumer desire, agriculture has the ability to produce these things, but it comes at a cost. Some of these attributes are easy to verify, calorie levels for example. Calories can be measured or calculated by the consumer if they wanted to verify the information and is the same for every one of the specific product produced. However, the attributes that are getting the most attention lately are the ones determined many steps ahead of the customer and can't be determined by testing the final product. Both the consumer and the producer need to rely on other forms of tracking the information and making it accessible to the end user. Both parties can see benefits from using and sharing this information.

Canada Beef Inc., the body which oversees domestic and international beef marketing reports that Canada's grain finished beef is well marbled, flavourful and tender, traits which are desired by consumers in more than 100 countries. Canada is a land of wide open spaces, rugged terrain. It is a country designed to produce beef. Every province has a beef industry and we are lucky to have an abundance of resources to support our 3.8 million beef cows. Canada produces 1.74% of the world beef supply (Cook 2015) and holds 20% of the world's fresh water (WWF Canada n.d.). All of this combined means that the beef industry contributes

almost \$2.5 billion to the Canadian economy each year (Agriculture and Agri-Food Canada n.d.). In addition, the Canadian industry has done a lot of things right in building infrastructure that supports the production of a high quality product. We have a strong domestic demand but due to limited population size Canada is export dependent.

Agriculture has been tracing products for many years and the Canadian beef industry began a national traceability system in 1998 with the creation of the Canadian Cattle Identification Agency (CCIA). The system revolves around a Radio Frequency Identification (RFID) tag that is required to be used in all cattle when they leave the farm of origin. These tags are linked back to the farm and assist in tracking an animal throughout its life during a disease outbreak. Voluntary information such as date of birth, premise identification and sex of the animal are available to include. Specific requirements regarding mandatory information and enforcement are left up to each province.

Transparency and traceability go hand in hand. How does an industry claim that it is open to consumers but not provide them with information they seek or prepare to provide information in the future. This report will focus on existing traceability systems in the countries visited as well as speciality branded beef and food programs that are examples of organizations promoting specific attributes. I will highlight countries that have laws and/or government programs promoting and enforcing origin of products traceability. Finally, I will discuss consumer preferences in various export markets important to Canada and report on informal polls that I did while travelling.

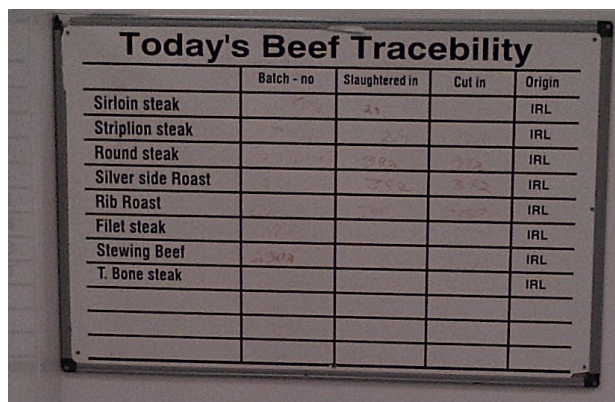
Traceability is the verification that will drive niche marketing forward as we move away from a commodity based beef product. Commodity products will always be in demand; the lowest price will win many battles. However, with all that Canada has to offer why would we want to continue to undervalue our exports? We produce a high quality product that happens to be a little more expensive to produce (thanks to our northern geography) but it does not mean that we don't have a lot of other great things going in our favour. We should use this to our advantage and provide accurate information that the consumer wants; whether that person is a mom in downtown Toronto, an importing company in the European Union or our neighbour down the road. Everyone has the right to know what ever information they want about their food. This should be a basic right, alongside the right to clean water. Most people cannot produce their own food nor do they want to but we must not take that simple fact for granted. I am a firm believer in the "If you ate today, thank a farmer" mantra but I also believe in "If you farmed today, thank a consumer." We cannot have one without the other.

2.0. Traceability Systems

2.1 Overview

Traceability is all around us, so much that we take it for granted more often than not. For example, purchases made online are tracked from order to arrival in your mailbox and checkout scanners at your grocery store track inventory levels of every product. It exists in complex supply chain logistics and in labels attached to homemade jam jars. In agriculture it is common in animals to use ear tags, produce products use four digit codes found on the packaging or stickers on the product itself. Seafood is commonly traced as a group kept together across their entire lifecycle.

Whether simple or complex, traceability provides a way to share information with other interested parties. It also comes in many different forms; labels on packaging may be the most common but not the only way. For example, in a grocery store in Ireland the sign in Figure 1 was used to share information with people purchasing beef. I also discovered traceability on a Ketchup bottle in Brazil. It was at a restaurant in São Paulo, a label on the bottom told the consumer the date it was opened and the cut-off date the restaurant had deemed it to be thrown away. It was added in the last phase of the product and was a simple method to build trust between the establishment and consumer. Traceability can take many different shapes and ideas, there is no one-size fits all solution but discussing and learning about other systems can help everyone.



	Batch - no	Slaughtered in	Cut in	Origin
Sirloin steak	751	21		IRL
Striplon steak		21		IRL
Round steak	21	21		IRL
Silver side Roast		21		IRL
Rib Roast		21		IRL
Filet steak		21		IRL
Stewing Beef	21	21		IRL
T. Bone steak				IRL

Figure 1: Chart at beef counter in Irish grocery store.

2.2 Primary Producers

All countries had a national traceability system¹ which uses an ear tag based system, most are electronic identification (EID) and are run by the government. All are focused on

¹ Except China who does not have a traceability system in place for cattle.

health tracking and were brought in because an export market asked for it. Here the similarities end. Table 1 shows the differences in the system in an abbreviated form. The full comparison chart is available as *Appendix 13.2 Comparison Chart of Traceability Systems around the World*.

Table 1: Traceability Systems Compared, Short Version

Country	Name of Program	Governing body	Official ID	Online or paper based	Reason for bringing it in
Australia	National Livestock Identification System (NLIS)	State Governments	EID; 9 or 10 approved tags	Online but animals travel with paperwork (per load)	Marketing (EU) and food safety
Argentina	SENASA	SIGSA (government)	2 tag system - EID and visual Allflex tags	Online and in person at regional offices	
Brazil		Database is state run and reports to Federal Gov't	No ID required, inventory based tracking	Both, electronic database and paper copies travel with trucks	track vaccines given
Canada	Canadian Cattle Identification Program (CCIA)	Board of Directors from Industry groups	EID - 6 approved tags with multiple variations from various manufacturers	Both	Animal health
France			2 tag Visual (barcode) tag, Allflex		
Ireland		Government	EID	Online	
United Kingdom		Government	2 tag Visual (barcode) tag, EID available and soon to be mandatory, Allflex	Paper "passport" follows animal to each owner	

Uruguay	National Livestock Information System (SNIG)	INAC - The National Meat Institute	2 tag system - EID and visual Allflex tags	Online	keeping export markets after FMD outbreak
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Brazil is an abnormal case in that they only track the number of head on the operation, which does not require individual animal identification. As animals are sold or harvested, numbers are deducted from the producers inventory, checks and balances happen when a producer sells more calves than they have registered. Every other system is based around a tag bearing a 15 digit International Organization for Standardization (ISO) recognized number, oddly enough even the countries like France that do not require EID still use the 15 digit number. Each country builds the number differently and learning to read a number can often tell you the entire story of the animal. For example, in Argentina the unique animal ID number is made up of a province ID (01), the town (044), the office (1), the farm (3478) and the animal id (00001) to be read as 010441347800001. Date of Birth and sex were the two most common pieces of information required to be attached to a tag number in a national database. This is the most basic information to include as herd of origin is already tied into the tag numbers or sale of the tags. All countries except Australia and Canada² require a matching two tag system.

When producers were asked what they thought about their national traceability they were pretty unanimous in saying they did not like the extra paperwork involved but recognized the need for it and have accepted it. Countries like Brazil and the United Kingdom have heavy fines that are enforced to ensure producers comply and processing plants verify information and hold cattle that do not comply until paperwork is settled.

At a dairy farm in China they were voluntarily using EID as in herd traceability to track health and production for their own purpose. Others I met in the United Kingdom (UK), where EID is not mandatory, wanted to use EID due to the ease of data transfer but could not commit to the additional cost, they were waiting until it became mandatory. None of the countries visited had integrated specific national tracking systems for the producers to utilize the technology at the farm level. Ireland was the only country in my study that had integrated the paperwork aspect to the system for the producer but no one else has. In other countries there are separate documents to fill out for each database a producer needed to submit data to. This may be the biggest missed opportunity for all systems.

² ATQ and Canadian Dairy Network are exceptions in Canada.

2.3 Processing Plant

The level of traceability in the processing plants abroad is far more advanced than I have seen in North America. They are also fundamentally similar even when businesses are geographically vastly different.

The first example is from Australia where I had the opportunity to tour a mid-sized packing plant, processing 200 head per day. The traceability stays with the animal throughout its journey in the plant and is continued all the way to the grocer's shelf. The National Livestock Identification System (NLIS) tag tracks the animal until the tag is removed, then the plant's own internal system takes over; the data from the kill floor, the bone room and the packaging room all



Figure 2: Box Label from Processing Plant, AUS

talk to each other and maintain the traceability component. Carcasses are tagged on each quarter with information including kill date, carcass weight, detention information, grade and an internal tracking number which is linked to the National Livestock Identification System (NLIS) tag number. A portion of this data is also transferred to the box label and travels with the product on the packaging to the retail outlet demonstrated in Figure 2.

The second example of a very similar traceability system was in a plant in Northern Ireland. They can process 400 - 500 cattle per day. This particular company has multiple locations and uses a specialized in-house software system to track the data on the animals after the tags are removed; the tag number is again correlated to a kill number which is assigned by the plant. This new number stays with the product until it is purchased by the end consumer, it is attached to each quarter with the same information used in Australia, it appears printed on the box label and finally on the consumer packaging during the final stage of fabrication. Even ground beef is fully traceable back to the animal and therefore the farm of origin.

2.4 Auction Markets

When the Canadian beef industry talks about enhanced traceability and movement reporting a discussion always surfaces around how to make it work at auction markets. The Canadian beef industry heavily relies on buying and selling cattle at auction across the country, as almost all commercial cattle are sold at least twice in their lifetime.

Every country I visited had movement traceability requirements however cattle change hands less frequently in these countries. Most often the cow/calf producer in Argentina, Australia and Uruguay keep the calves and finish them on their own grass. Cattle are then only

sold directly to the processing plant. Auction markets do exist in these countries but are smaller and used less than in North America. These locations all have to scan in and scan out animals from the property. In Argentina this is done by staff from the local traceability office. Each town of significant size has a traceability office and they use wand readers to record the data. It then gets uploaded directly to the national database. Other countries employ a similar model, however who performs the data recording is different based on program administration.

2.5 Irish Cattle Breeding Federation (ICBF)

ICBF exists to benefit our farmers, our agri-food industry and our wider communities through genetic gain. We do this by the application of science and technology to ensure that our farmers and industry make the most profitable and sustainable decisions, through the use of the services provided from the ICBF cattle breeding database. (Irish Cattle Breeding Federation n.d.)

ICBF has a specific role in agriculture in Ireland. They are an interesting model and work in both the beef and dairy industries. The centre of their operation is the database. Like everything else, the more data you have the better and this organization has it all. Figure 3 represents the data flow of the organization. They use information from all other organizations to provide a service that helps steer overall progress and to help individual producers excel.

After talking to people there, I realized that because of the high level of government involvement in agriculture and the subsequent regulations imposed on them, much of this data is mandatory and then can easily be shared. Producers when they sign up are asked for authorization to share their data with AI companies, for example and producers do pay for the service through performance reports and consulting assistance services.

Having all the data from all the breed registries allows ICBF to also do a number of benchmarking studies and offers the industry Across Breed Genetic Evaluations and the Euro Star ranking system that works within breed as well as across breeds.

They assist in the administration of a number of government funding programs which are linked to increased data collection. Often to encourage data submission there is a financial incentive.

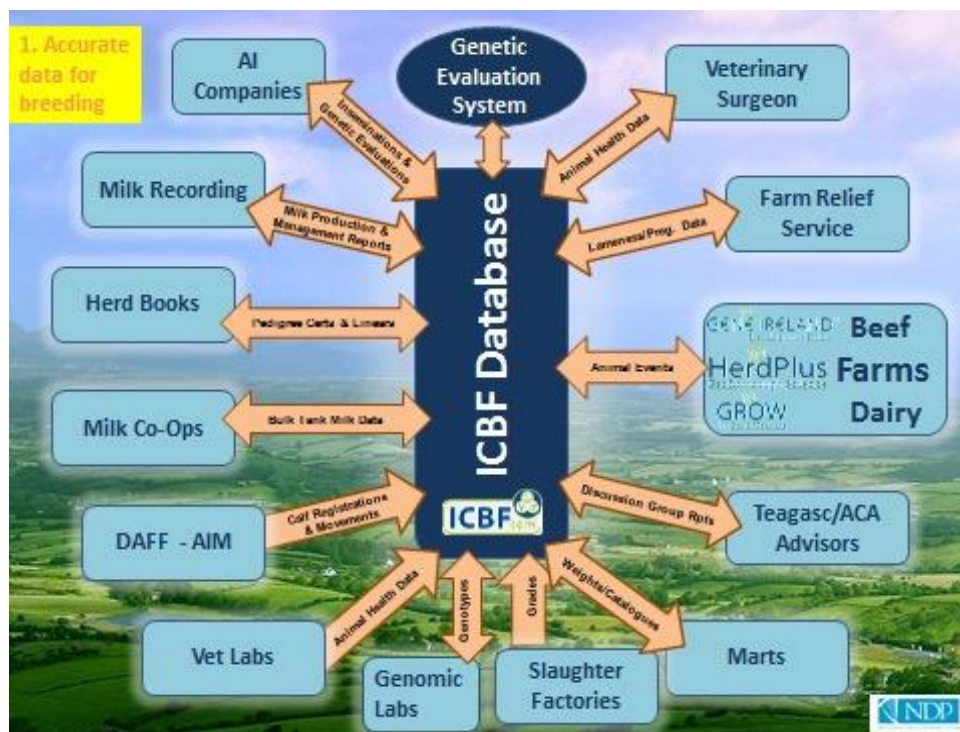


Figure 3: ICBF data flow (Irish Cattle Breeding Federation n.d.)

2.6 Uruguay Case Study

A small country that is big on agriculture, a country where cattle outnumber people four to one, where they export 75% of their beef production but are also the second largest beef consumers per capita in the world, consuming 53 kilograms of beef per person per year (Meat Uruguay n.d.). They are also noted as having the world's first fully traceable beef industry. SEIIC which translated from Spanish stands for Electronic Information System of the Meat Industry is administered by INAC, the National Meat Institute.

It uses an online based system where approved professionals and farmers can input specific pieces of data. The Government of Uruguay is continually investing in the strengthening of telecommunications across the country in part to facilitate ease of use of this system. The database belongs to the Ministry of Agriculture (MGAP). The data captured and the information generated by the system is confidential and use is restricted to traceability.

Animals have to be double tagged and recorded prior to six months of age; mandatory information is date of birth and sex linked to a tag number. Each animal or tag is linked to a farm's DISCOSE number³ and time of shipping. All movements are tracked and recorded in the database, animals have to be inspected first and a request is submitted to the administrators. This is done by an approved, trained representative often a veterinarian who has taken additional training, at an additional cost to the producer. These requirements exist to protect the integrity of the data I was told. The movement is recorded in the electronic system and a hard copy of the information is sent with the truck. At shows and other co-mingling

³ A premises ID in Canada

events all animals are scanned in and out with that information being uploaded to the database as well. Completed vaccines are also recorded in the same database; brucellosis and foot and mouth vaccines are required in Uruguay. Tags have been provided free by the government since the program's inception.

Uruguay uses the RFID tag number to track the beef after processing through to the consumer. Once the tag is removed, a carcass tag is attached, exactly like it is done in Australia and the UK, that number is linked to the RFID tag number and the new number is read through the plant via a barcode. Every processing plant in the country has seven "black boxes" or readers in place, strategically placed along the line, they are referred to as; live weight, bleeding, pre-dressing, classification (grading), deboning room entry, deboning room packing and box dispatch. This traceability process is also being used to verify the Certified Natural Meat Program showing that value added attributes can be added onto a national health traceability system.

Their system is relatively new and was adopted after an outbreak of Food and Mouth Disease (FMD) and passed into law making it mandatory in 2006. MGAP claims that their traceability system has also significantly decreased the problems with illegal movements of cattle within the country. Previously they utilized a group traceability system which began in the country in 1976 and was used until individual traceability took over. A combination of hot branding, numerous paper forms and total head per farm were tracked. The 100% online system was phased in and accepted in 2010.

3.0 Laws & Regulations

3.1 Australia

Australia has proven in court what can be sold under a breed based branded beef program. An animal must be 75% of one breed to be sold under a breed specific label. For example, Angus branded programs must source cattle that are each a minimum 75% Angus genetics to fill their programs. Certified Australian Angus Beef (CAAB) takes a deoxyribonucleic acid (DNA) sample from every qualifying carcass and does random genetic testing on them which confirms genetic composition and whether they are meeting the 75% target.

3.2 European Union

The EU has required its food suppliers to have systems to ensure the traceability of products since January 2005. This includes all imported food products and was the catalyst for many national identification systems in beef exporting countries.

3.3 France

At a hotel I was staying at near Borges, France I came across a notation on the menu for the hotel restaurant. The menu in the room said “Information regarding the origin of our meat is on display in the restaurant.” Down in the restaurant there was a sign that had each cut of beef on the menu along with the born, raised and killed information, clearly accessible and available to any inquiring customers. This is now required by law in all restaurants in France. In this instance each cut was born, raised and killed in France but the sheet could easily be updated when the supply changed based on the information provided by the processing plant on the product packaging. This is a direct result of the horse meat scandal in 2013⁴ and has been required ever since.

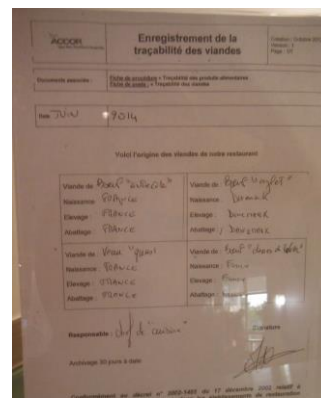


Figure 4: Chart at Novatel Restaurant, Borges, France

3.4 Geographical Indications

Protected Geographical Indicators (PGI) and Protected Designation of Origin (PDO) are recognized in European Union (EU) legislation along with Traditional Specialty Guarantee (TSG). Since 1992, PGI's are a way to ensure that foods or food products originating in a certain region can only be labelled as such when produced within the parameters. PGI, “covers agricultural products and foodstuffs closely linked to the geographical area. At least one of the stages of production, processing or preparation takes place in the area;” PDO, “covers agricultural products and foodstuffs which are produced, processed and prepared in a given geographical area using recognized know-how;” and TSG, “highlights traditional character, either in the composition or means of production” (European Commission 2015). Champagne is a perfect example of a Protected Geographical Indicator; only sparkling wine produced from grapes grown in the Champagne region of France can be labelled as such. Products originating from a different country or even a different region in France must be called Sparkling Wine. This law allows producers of specific products to obtain a premium price for their authentic products and ensure that regional branding is maintained and that there is no opportunity for copycat products of possible inferior quality to enter the market place.

There are a number of beef specific products designated under this program. From the United Kingdom: West County Beef, Scotch Beef, Welsh Beef and Orkney Beef (PDO). In France, Charolais du Bourbonnais (PGI) is also recognized. Many French pork and lamb products are also listed as PGI's.

⁴ Foods supposed to be 100% beef were found to have a high percentage of horse meat and/or pork in them, a prime example of traceability break down in the food system.

3.5 Vaccine Laws

In the South American countries I visited, Argentina, Brazil and Uruguay, mandatory bovine vaccines are tracked through the national traceability system. Recording the completed vaccinations becomes a trigger event for the tag, that it is active much like age verification does in the Canadian system.

3.6 Data Usage and Ownership

Ownership of data is a highly debated topic in Canadian agriculture right now. As the amount of data grows so too does the size of the debate on how that data should be handled. In Ireland, ICBF will release data for research purposes, if it is for the good of the industry. All parties are made aware of this possibility and they acknowledge this during the registration process. There has to be a direct benefit back to a sector for the research to be approved.

Most government databases are sitting idle, collecting data with nothing happening with it after the fact. Private operations have shown the benefit of using this data, like the feedlot in the United Kingdom that makes purchasing and feeding decisions based on EID tracked information. Widespread data usage is under-utilized in all parts of the world and presents an opportunity for advancement in beef production.

4.0 Branded Beef Programs

4.1 Certified Australian Angus Beef (CAAB)

Formed in 1996 by the Angus Society of Australia (ASA), it is now the largest and most awarded branded beef program in Australia and remains owned by the members of the ASA. It was developed in part because customers in the EU and Asia asked for third party verification on Angus claims. The program takes animals that are 75% Angus genetics and the processors decide whether they accept red hided cattle; there are no minimum quality specifications. The other 25% of the genetics need to be a British origin breed or Waygu. Cattle need to be correctly described and producers declare the validity of the claims on a legal affidavit. Genetic composition is determined by a DNA test; samples are collected from each carcass and random verification is done and any problems are investigated using the stored DNA samples.

There are two Angus burgers at McDonald's Australia and CAAB supplies the product for both. This has been happening since 2009. Six major processors in the country produce CAAB product and 20% of the product is sold domestically, the other 80% sold internationally.

4.2 Irish Angus Producer Group

Started by a group of Angus producers who wanted to secure better marketing for their product, the Irish Angus Producer Group runs on a membership enrolment which gets collected at animal harvest in the form of a levy. The program pays a premium back to the producer

based on two factors; the time of year of harvest and the production system the producer uses, as this affects quality. Progeny from dairy cows bred by Angus bull are eligible for the program. Premiums range from 10 c/kg – 40 c/kg (Euro cents) based on the fore mentioned attributes (ultimately quality) and there is also a 12 euro cent per kilogram premium available for producers operating under the Bord Bia Beef Farm Quality Assurance Scheme. Beef is processed at ten facilities across Ireland. In each of these plants there are inspectors who look at and report on all cattle marked for the program, any that ultimately get rejected get reported back in real time. This information is sent to the office via an app and sent to everyone involved right away.

DNA samples are required to be submitted by the producer on every breeding bull and then samples taken from each carcass are cross referenced to determine Angus-type qualification via sire verification. The program uses the ICBF database to confirm information given by the producer.

4.3 Others

There are a multitude of branded beef programs around the world. Most are breed specific like the Angus programs listed above or the Charolais programs in France. France is the origin of the Charolais breed and they are very proud of this, more so I found than other French origin breeds like Limousin. Charolais beef is found in McDonald's and Starbucks among many local restaurants. Hereford is also a popular breed to build branded programs around. Hereford programs were more common in South America and the United Kingdom.

By far the most common type of branding I saw was based on regional attributes and focusing on eat local initiatives. This was apparent in each country I visited even though the definition of local was different depending on where in the world I was sitting. In Europe, local was the same town or county (region in France) it was within an approximately 20 kilometers radius and there was a good chance that the consumer could purchase product from someone they would get to know. Butcher shops were abundant and available in every town and even at local fairs in the form of food trucks. In Uruguay, local meant from within the country. National pride rang true at the meat counter with flags hanging and assurances that beef was Uruguayan, branded beef programs (aside from Angus) and localized regional branding were nonexistent.

5.0 Eat Local Programs

5.1 Taste of Ulster

Taste of Ulster is a Food Northern Ireland (Food NI) program which has been around for 25 years. They are a link between producers, food service and consumers; a marketing and



Figure 5: Shield displayed outside a restaurant, Belfast, NI

lobby organization who also facilitates cooperation among special interest producers. They produce 50,000 copies of a tourist focused, eat local guide each year that lists their 150 members. These guides are available at airports, ports, Tourist Information Centres, attractions and member establishments. They are given to journalists and available at events they participate in. To be included, restaurant members need to source at least five major ingredients from Northern Ireland; they are inspected by Food NI annually and must reapply each year. Part of the inspection process includes ensuring the front line staff can speak about the products on offer and the program.

Taste of Ulster believes that chefs are the key in the link between producers and consumers and part of what Food NI does is encourage members to change menus seasonally to ensure locally produced foods are always available. They help create linkages between food services, retail and the producers. They are involved in many food events across the region but do not host their own, they piggyback on existing events and support member events. One interesting program they are involved with is the “Who made my Breakfast?” booklet for the Hastings Hotels. This booklet is available to guests at breakfast and lists all their suppliers from across Northern Ireland. This list includes apple juice, yogurt, milk, granola, oats, sausages, bacon, vegetables, jams/marmalades, coffee and tea. Each producer has a picture and a short write up about their operation, even a map is included at the back. The hotel writes, “we have gone the extra mile to find the finest locally sourced fresh produce to give you a real Irish breakfast experience.” (Hastings Hotels n.d.) It is a prime example of how a food service provider can work with a program like Taste of Ulster and local producers to tell the story of food production to a captive audience.

5.2 Back British Farming

This relatively new initiative is taking the United Kingdom by storm. The program started by the National Farmers Union (NFU) was an idea to gain support for British produced agricultural products. It is an entirely social media based program and has gained momentum in only a few short years. It sends positive messages about agriculture out to the general public, it encourages the purchase of British products and it also has a focus on children and the next generation. They can measure their impact based on media coverage and social media analytics. “The public [in the UK] is very interested in food and farming,” according to Gemma Fitzpatrick from NFU during an interview and this has helped their positive messages about



Figure 6: Red Tractor and Back British Farming Logos

agriculture gain momentum. They are also launching a focus on agriculture careers for the next generation. The NFU uses their existing strong relationships with the media combined with a databank of case studies on farmers doing innovative things that they can rely on when the media needs a story. The NFU provides time and resources regarding media training for producers.

British by definition is all regions located on the Island of Britain and those regions outlying islands. It is the United Kingdom minus Northern Ireland. Back British Farming as a program does not define what British produced product means or defines the term in any way.

The NFU also have a verification program called Red Tractor Assurance to ensure the highest standards are used to maintain quality and confidence in the food supply from farm to fork. The pillars of their program involve traceability, food safety, animal welfare and environmental protection. They use independent auditors to ensure each step adheres to their standards. The logo itself provides the traceability component as the flag used in the logo indicates the country where the food has been farmed, processed and packed. For example, if the bottom of the Red Tractor logo bears a Union Jack then the product is from England.

5.3 Australian Made

This is the premier program for agricultural product national branding that I saw. It is a cohesive approach used in domestic and international marketing and encompasses everything not exclusively agricultural products. The green and gold logo can be used alone or with a descriptor outlined below.

- Australian Made - product manufactured in Australia (not just packaged or assembled) and 50% or more of the cost of making it attributed to Australian materials and/or production practices
- Australian Grown - all of the product's significant ingredients have been grown in Australia and all or nearly all of the processing has been done in the country
- Product of Australia - all of the product's significant ingredients come from Australia and all or nearly all the manufacturing and processing has been done in the country
- Australian Seafood - all significant ingredients have been grown or harvested in Australia and all or nearly all the processing has been done in the country
- Australian - used only in export markets, the product must meet one of the above categories (Australian Made n.d.)



Figure 7: Australia Beef using the Australian Grown designation.

The logo is administered by a not for profit company and is not a government body. The company exists to license companies to use the logo to help promote Australian products.

It was everywhere, a high percentage of food products had it and grocery store signage explained what it was. I saw it again as the brand used at the SIAL food show in Shanghai throughout the Australian food product displays and marketing material. It is a cohesive approach to national identity and branding.

5.4 South America Model

Combining these countries together is not fair however they share many similarities in beef consumption that I would be repeating myself treating them separately. Residents of Argentina, Brazil and Uruguay eat a lot of beef. They are three of the largest beef consuming countries per capita in the world. There is not a need to have Eat Local campaigns here as they do not import enough beef to make a difference. All the grocery stores I visited were bursting with national pride, flying the flag over the meat counter and shouting to consumer that the product was raised within the country.



Figure 8: Typical Meat Counter in Uruguay

6.0 Consumer Preferences

6.1 China



Figure 9: Cranes beside train tracks, north of Qingdao

China is like no other country, there are similarities to Hong Kong but it is still hard to compare the two beyond the surface. Every hour 2,500 people in China relocate from rural areas to urban centres (Su Hao 2014). Construction is booming and there were places where it was cranes as far as the

eye could see. It is a mix of old and modern creating a fascinating culture. According to

Charles from Huazia Dairy Farm, consumers are more concerned with food safety than price. His product, in the form of fresh milk sold through a local grocery chain, however caters to a customer who wants a safe, Chinese produced product. As average incomes rise and expat communities flourish there is a growing demand for high quality, value added attributed

products. I heard unconfirmed reports of a growing demand for organic products in parts of Beijing.

The SIAL Food Show in Shanghai is an annual conference of all things food. An absolute overload of the senses; domestic and international brands fight for sales and shelf space in Chinese grocery stores. It is a trade show for industry and consumers do not attend. Flashy displays, women in fancy dresses and free samples all work to lure retailers and foodservice professionals towards a product and it works. All around the show, booth after booth had meetings happening and deals being signed. Competition is fierce and new products are launched beside old favourites, while exporting countries work to get more of their product sold in the country. It was a prime example of how business is done in China. It is billed as, “The Asian Food Marketplace” and is the leading meeting place for the Asia food and beverage industry. They boast:

- 2,400+ exhibitors
- 45,000 visitors
- 100,000 square meters of exhibit space over eight halls
- covers retail, catering, hotel/restaurant/catering, food services, the import/export trade and manufacturing
- snacks & sweets, frozen foods, fruit & vegetables, beverages, seafood, beer and meat

Quality alone will not allow Canadian products to grow in the Chinese marketplace. They are not used to making buying decisions based on only one thing. Canada Beef Inc. was a sponsor of a cooking competition that utilized Canadian product at SIAL, I caught the final awards presentation and it was great coverage which showcased beautifully on our high end beef products.

6.2 Hong Kong

Hong Kong is an affluent, heavily western influenced country. American chain stores and restaurants are everywhere; designer products are easy to find, Starbucks is basically on every block and one is never far from a shopping mall. Food is inexpensive and the variety is endless yet with all of that wet markets remain a main source of fresh food for locals. Daily markets offer up all types of traditional foods as well as western products. Beef was hard to find at these markets but pork and chicken were abundant. Each meat merchant had a few pork quarters hanging in the stall and the customer requested an



Figure 10: Pork for sale at a traditional wet market.

amount to be cut off, it was weighed and sold, likely to be cooked later that night. Beef quarters are too large to handle in this type of facility. Imported beef was readily available at grocery stores and restaurants. Each label listed the country of origin, the kill date and the name of the cut in English. The product was expensive and had large amounts of external fat on it which appeared to be the norm. For example, I ate one night at The Dog House, British sports bar on the waterfront, not a fancy place but comparable to a common place in Canada. I had the Australian eight ounce ribeye steak, cooked medium, priced at \$42.00 CAD. There was so much fat on it, it turned out more rare than medium and was an all-around terrible eating experience, I expect the problem is that there is a lack of knowledge on selecting and cooking beef to the way familiar with most Canadians, including myself. This represented to me an opportunity for knowledge transfer which will be very important as we continue to expand into Asian marketplaces.

6.3 European Union

In France especially but throughout Europe I found that consumers have a different relationship with food. They savour it, take time to enjoy it and it has a much more regional influence to it. I did not have a meal in France that was less than three courses. The food and the regions have notoriety to them and are often recognized as PDI's. That is ultimately one of the reasons why I went to France, to learn about European consumers you must visit the country that is known around the world for their fine cuisine. European consumers want to eat food produced in the region they are living in or visiting and they are willing to pay a premium for it. The regional pride in food is similar to Canadian's loyalty to our hockey team of choice.

There is a pride in Normandy for example, that their food products; meat, cheese, caramel sauce in their opinion is the best. They show off their products in restaurants and stores, competitions are held and trophies are displayed in butcher shop windows and hung on the wall of the restaurants. There is a loyalty to the traditions and an innovative spirit to work towards perfection. There is no need for regional branding or promotion beyond this, they have been doing this for so long the people there do not know any different.

7.0 Consumer Packaging and Preferences

7.1 Beef Consumption

The amount of beef and red meat consumed by a country's population dramatically affects the beef industry within that country as well as those countries exporting product to the area. Preparation methods also vary widely and in my observations, the popular methods of preparing beef is directly correlated to how much beef is consumed. Figure 11 shows beef consumption by country around the world.

Meat consumption Beef and veal / Pork meat / Poultry meat / Sheep meat, Kilograms/capita , 2014

Source: OECD-FAO Agricultural Outlook (Edition 2015)

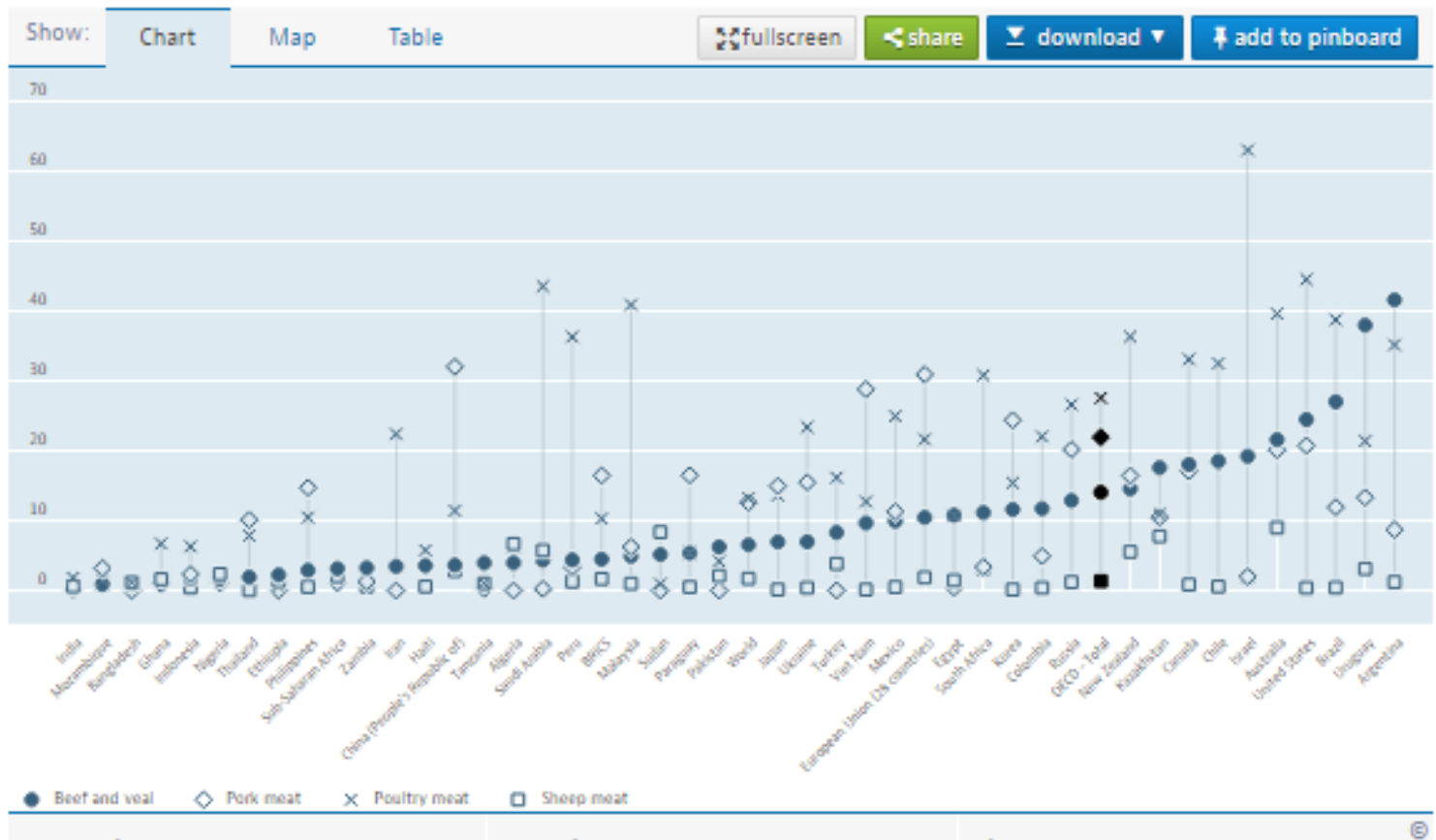


Figure 11: Beef Consumption by kg per capita (OECD n.d.)

Countries in the EU and Asia cooked their beef completely through, there was no pink visible. In China this is linked to the added health risk of contamination and subpar sanitation during preparation. All meat I saw in traditional settings in China also had a large layer of external fat which was also consumed as part of the meal.

Alternately in Spanish South American countries parilla's are the most common method of cooking meat.

Parrilla means grill, and can also mean a steakhouse in South American countries. An Argentine parrilla can be anywhere from 5 ft to 20ft in length. You build a fire on the side of the Parrilla using natural wood, charcoal and/or mesquite. Once the wood and charcoal is smouldering it's transferred to the Parrilla where it warms the Parrilla for short period of time and then a variety of meat is placed along the length of the Parrilla. This includes: several cuts of meat, sweet breads, sausages, and chicken. The meat is slowly grilled for anywhere from 45 minutes to a couple hours, the smell of the meat and grill is intoxicating. Slow grilling over an open fire results in meat that is mouthwatering, tender and juicy (Javi's Parilla 2015).

Brazil has a slow grilling method of their own, the cook prime cuts of meat on a metal skewer which gets slowly turned over an open flame then carved at the table for guests. Beef tastes better when it is cooked to perfection over a grill and it shows as traditional cooking methods in these countries also means higher consumption per capita.



Figure 12: Parilla in the Pacin's home, Argentina

7.2 Beef Packaging

Table 2: Label Information By Country⁵

	Australia	China	UK	France	Ireland	Brazil	Uruguay	Argentina	Canada
Country of Origin	✓	✓	✓	✓	✓	✓			✓
Country of Secondary Production			✓	✓	✓				
Country of Processing			✓	✓	✓				

⁵ Based on informal visits to multiple grocery stores around a country

	Australia	China	UK	France	Ireland	Brazil	Uruguay	Argentina	Canada
Lot/Batch Number			✓	✓	✓				
Cooking Instruction			✓	✓	✓				✓
Cut	✓	✓	✓	✓	✓	✓	✓	✓	✓
Quality Assurance Program			✓		✓				✓
Slaughter Date		✓							
Products with 3 or more verification seals	✓		✓	✓	✓	✓			

7.3 KTBA

KTBA is a Dutch company that I met at the SIAL Food Show in Shanghai. They focus on food safety, food labelling and import regulations for companies exporting food products. It is the only company of its kind in the world. There are others who perform this service however they focus on only one or two countries, KTBA has 70 consultants and they specialize in 40 countries. They are experts in the field of moving food products around the world. From them I learned that the EU is phasing in standards for food labelling, in principle, each country however, for the foreseeable future is sticking to their own existing regulations. Their entire business is sorting out food labelling and import rules, the global requirements for this type of transaction is complex and can be frustrating for smaller companies.

8.0 Consumer Information Validation

As I travelled, I took the opportunity to do information polls at restaurants in many locations. My objective was to determine which marketing claims made by the establishment were easily verifiable and how knowledgeable the waiter or manger were about the beef products they sold. I only ever asked about beef and only when claims were made on the menu or on a sign within the restaurant.

8.1 Australia

I am Angus steak house, Darling Harbour, Sydney March 1, 2014

I asked the waiter where they sourced the beef from and his quick response was they partner with producers in Queensland to get the Angus product; it is a closed supply chain. He didn't hesitate and was very friendly and knowledgeable.

Woolworth's, Alice Springs, Northern Territory, April 2014

Mrs. Macs Family Bakery "Angus Steak Pie" claims to be, "verified Angus" and, "The Best from the South West" I checked the website for information and can't locate the pie on their list. The Angus sausage roll has no verifiable information regarding the source of the beef.

Grill'd, Brisbane, Queensland, April 24, 2014

100% grass fed, "healthy burgers" at a higher end fast food place which I would compare to Hero Burgers in Canada. I asked the guy at the counter and he was very knowledgeable, he told me the beef comes direct from a farm in the state of Victoria, he tried to remember the name but could not instead he directed me to the company website. Upon further investigation the website simply refers to, "a small collection of family run businesses that raise their cattle in the cool climate of country Victoria" (Grill'd n.d.).

8.2 Northern Ireland

Morning Star Pub, Belfast, August 18, 2014

I learned about this place from my meeting with the Taste of Ulster group, a traditional pub in a historic building on a beautiful side street near the centre of Belfast. The pub and restaurant is owned by farmers who raise their own beef, herbs, vegetables and eggs. They tell their story on the menu and the website gives more information and a forum for feedback on the steaks. They are very proud of their roots and are a closed supply chain. The waitress that I had that day didn't know what breed of cattle was used, where the farm is located or anything about the pork which according to the menu was not raised by the owners.



Figure 13: The inside wall of the pub.

8.3 France

Alltech Beef Tour, Borges region, France, August 28 - 29, 2014

In the heart of Charolais country, the region of France where the breed originated, branded Charolais beef is big and there are a number of programs that are breed specific. The McDonald's booth at the World Charolais Congress advertised two separate Charolais burgers. The butcher shop in Borges had Limousin branded beef and pork from the Limousin region and the Hotel we stayed at, Novotel, has a minced Limousin beef burger and a Mince Limousin beef

steak on the menu. Due to language barriers I was unable to talk too many of the staff to confirm claims.

Beef Discussion Dinner, Alltech 500 Conference, August 31, 2014

Dinner was served and it was steak. An Australian at the table asked the waiter (through a French speaker also at the table) what cut of beef we were served. The waiter did not know, he asked a colleague who said “fillet.” We were unable to establish the breed of origin of the meat but he was able to tell us it was from France.

8.4 Other

Moxies, Prince George, British Columbia, Canada, March 28, 2014

I asked the waitress where they sourced their beef, branded as AAA, Alberta Beef. She didn't know and was surprised at the question. She proceeded to tell me that she had never been asked that before. She had been asked in regards to the seafood, but never about the beef. After a few minutes she volunteered to ask the Chef and came back to report that he had to think about it for a minute but said “Calgary.”

Grocery Store - SoHo, Hong Kong (on the escalator) May 2, 2014

A very small beef section compared to pork and chicken; small portions, cheap, New Zealand and Australia fresh beef, mostly precut pieces and small steaks, ground pork was offered but no ground beef.

Hong Kong Island - May 2, 2014

Other restaurant menu's I looked at today featured New Zealand, Australia, United States Prime and Certified Angus Beef (CAB).

Melissa's Restaurant, CityWalk Mall, Hong Kong, May 3rd, 2014

This was the only restaurant with Canadian Pork on the menu that I saw in Hong Kong, they also had United States and New Zealand beef.

Merck Animal Health Beef Carcass Program, Olds, Alberta, Canada July 2014

This was a farm to fork training program for Merck customers that I was invited to participate in. One part of the program required a variety of beef to be cooked and sampled by the group. The facilitator purchased various branded products for the demonstration and had two problems arise. One was a Grass-fed product purchased in downtown Calgary that was proven not to be from a grass fed animal based on the colour of the external fat. The second was a cut labelling issue where the cut was identified as a Flatiron steak when in fact it was a not. The meat scientist involved in the program correctly identified both products.

9.0 Conclusion

There are no right answers to the questions posed at the start of my study. Each country and each group of consumers want different things. Cultural norms and traditions all influence what people want to know about their food. Some commonalities did stand out. First of all, national traceability systems are used primarily for animal disease containment and eradication. Animal health and marketing requirements should be kept separate but information should be moveable between databases. No producer wants to enter data in more than one spot. These Animal Health tracking systems are entirely Government run in most parts of the world and overseen by Government in Canada. This involvement is an important component of their creditability to foreign governments. Our ability to trade and export to is based on these systems. There will always be a need for Government involvement to provide integrity and verification. If the Canadian industry chose in the future to implement an enhanced system, along the lines of what Uruguay has done, significant Government subsidy and involvement would be needed. These systems are expensive to implement, vital to International trade and may not be able to stand on their own.

Secondly, breed based marketing and Eat Local campaigns are the most common form of value added attribute marketing used around the world. Eat Local campaigns may be defined differently but are essentially the same and an easy way for consumers to connect to their food supplier. Farmers Markets, marketing campaigns, social media and protected geographical designations all help make the link and are all important. There are many private traceability and verification systems in place in Canada⁶ that provide this service for the cattle industry. These systems are proving to be very successful within the context of their demographic or need and will be an interesting aspect of the industry to watch in the future. Many of the additional claims seen in Canada are not used or are regulated by the Government in other countries. Labelling is not required as no product produced using those methods is allowed in. A prime example is the ban of cattle growth hormones in the EU and Australia; product is not labelled as, “no added hormone” like in North America. Food labelling laws across different countries is a complex web of specific regulations and requirements. These laws for the most part do not influence the branding opportunity for a product. National branding is very important and the easiest to trace, it should never be overlooked and greater utilized for Canadian products. These rules fall under the Product of Canada Guidelines as written by the Government of Canada. Their specifics are included in Appendix 13.4.

Finally, any product being sold with a claim regardless of whether it is marketing or food safety based needs to be verifiable. People working on the front line and selling our beef through a restaurant, food service or retail establishment need to know more about the product and what the claim actually means. Having inaccurate information given to consumers

⁶ A list of programs in in Appendix 13.5

will only hurt the industry in the long run. We may be a few steps removed as producers but it ultimately is our product on the plate. The entire supply chain needs to be more concerned about the information being presented or lack thereof at the final level.

In Canada we have abundant choices in how we raise our animals and what we consume. We need to protect this power of choice. Eat Local campaigns may be defined different in each country but the fact that they exist everywhere is the purest form of National pride. Nothing is more powerful for a nation than being able to feed its own people. However, all of us have grown accustomed to having certain food luxuries that a Northern climate does not allow us to produce domestically. Countries like Canada will always need to supplement with imported food. Using as much as you can of what is produced at home and diversifying that production within the limitations of the land and climate is fundamental.

Beef should be fully traceable. Any information a customer wants should be accessible to them, the technology exists to capture and transfer this information. As producers we need to work with the end users and everyone in the supply chain to simplify things, to provide the information they are asking for and ensure each person along the way is armed with accurate, reliable information. In every business there is a product and someone who wants or needs that product, a consumer. It boils down to basic supply and demand. As farmers our product is food and we are lucky that our food is in demand by people around the world. According to Hans Johr, from Nestle in his presentation at the 2014 Alltech Conference “The future of the beef industry is traceability. It will drive the food supply chain and our use of technology.” Johr was making reference to traceability in regards to building trust with consumers and preventing the possibility of another food scandal. There are many opportunities in traceability for producers as well. These opportunities should not be wasted; we should embrace the technology available and a new way of looking at data. The only thing constant in life is change.

10.0 Recommendations

- ❖ Enhance and expand Product of Canada guidelines and investigate the opportunity for an independent organization to oversee and promote the brand on all commodities
- ❖ Track greater data through our national traceability system and by requiring additional information such as a date of birth assigned to every tag
- ❖ Have a functional national database to trace value added data and enhance it based on specific branded beef programs needs
- ❖ As an unified industry continue to work with foodservice and retail outlets to ensure information they present to consumers is verifiable and accurate
- ❖ Enhance and expand regional eat local programs to encourage consumers to source local products and get to know the person behind the food
- ❖ Redesign labels on beef products and packaging to provide additional information to consumers
- ❖ Ensure beef producers in Canada understand how important traceability and consumer trust is and the need to keep that trust

11.0 Glossary and Abbreviations

Across Breed Genetic Evaluations – A genetic evaluation done with animals from different breeds that can be compared to each other within the evaluation, produces Estimated Breeding Values (EBV's)

Age Verification - In Canada the act of assigning a date of birth to a tag number in the Canadian Livestock Tracking System administered by CCIA. This process activates the tag in the system and can be an exact date or assigned a three month window calving season date.

Angus - A breed of cattle used for beef production originating in the Aberdeen region of Scotland. A Solid red or solid black hide colour. The most popular breed of beef cattle in North America and many other regions of the world.

Angus Society of Australia (ASA) - A producer organization in Australia made up of Angus breeders, responsible for marketing of the breed and maintaining the National herdbook.

Agri-Traceability Quebec (ATQ) – The organization responsible for animal traceability in the province of Quebec in Canada.

Bord Bia - The Irish Food Board who's mission is to “is to drive through market insight and, in partnership with industry, the commercial success of a world class Irish food, drink and horticulture industry.”

British Origin breed - A breed of cattle originating in the British Isle's. The most common examples are Angus, Hereford and Shorthorn.

Brucellosis - A bacterial disease that can affect cattle and is zoonotic.

Canada Beef Inc (CBI) - The Canadian organization responsible for the marketing and promotion of Canadian beef. An independent organization funded through check off dollars and government grants.

Canadian Cattle Identification Agency (CCIA) - An industry initiated and run organization responsible for the Canadian Livestock Tracking System which was designed for the containment and eradication of animal diseases.

Canadian Livestock Tracking System (CLTS) - The Canadian database housing animal data relevant to animal disease tracking.

Certified Australian Angus Beef (CAAB) – A branded beef program owned by the members of the Angus Society of Australia.

Certified Angus Beef (CAB) – A branded beef program owned by the members of the American Angus Association.

Charolais – A breed of cattle used for beef production originating from the Charolais region in Burgundy, France. A typical animal is white in colour.

Deboning – The process of removing meat from the bone for sale.

Deoxyribonucleic Acid (DNA) – A molecule that contains all genetic instructions for living things.

Dentition – The development of teeth and their arrangement in the mouth. In particular, it is the characteristic arrangement, kind, and number of teeth in a given species at a given age. A common method of determining the age of a bovine at time of processing.

Electronic Identification (EID) - A common way of tracking livestock also referred to as RFID.

European Union (EU) – A politico-economic union of 28 member states that are located primarily in Europe.

Eurostar Ranking – An assessment of genetic merit of cows in the ICBF database. A ranking system developed by ICBF.

Food and Mouth Disease (FMD) - A highly contagious viral disease of cattle, swine, sheep, goats, deer, and other cloven-hooved ruminants.

Food Northern Ireland (Food NI) – A not-for-profit organization who provides a single promotional voice for Northern Ireland's food and drink.

Grade - In referencing beef, a method of evaluating the carcass. There are 13 beef grades in the Canadian System. "Grading is intended to place carcasses into uniform groups of similar quality, yield, and value, in order to facilitate marketing and production decisions. Grading may

be used as a basis for producer settlement. Grading attempts to ensure that consumers have an improved product through greater consistency and predictability in the eating quality of specific grades of beef.” (from the Canadian Beef Grading Association website)

Hereford - A breed of cattle used for beef production originating in the Herefordshire region of England, a light red in colour with a characteristic white face, white belly and white sox.

Irish Cattle Breeding Federation (ICBF) A non-profit organisation charged with providing cattle breeding information services to the Irish dairy and beef industries.

INAC - The National Meat Institute, Uruguay

International Organization for Standardization (ISO) - An independent, non-governmental membership organization and the world's largest developer of voluntary International Standards.

Limousin – A breed of cattle used for beef originating in Northern France. A naturally, heavily muscled breed which has a variety of hide colours from light wheat to dark red or black.

Marbling- When referring to beef describes the amount of intramuscular fat in a cut of meat. The higher the amount of intramuscular fat the better tasting the beef will be.

Ministry of Agriculture (MGAP) - Uruguay

Muster - An Australian term for gathering a herd of livestock, typically cattle out of the fields.

National Farmer's Union (NFU) - A 55,000 member organization in the United Kingdom whose objectives are to champion farming in England and Wales and to provide professional representation and service to members.

National Livestock Identification System (NLIS) – Australian Traceability System

Parrilla – Spanish, means grill, and can also mean a steakhouse in South American countries.

Premise ID - In Canada a unique number assigned to a farm or ranch location for the purpose of traceability in animal production. This gets recorded in the Canadian Livestock Tracking System (CLTS)

Protected Geographical Indicators (PGI) A designation by the EU which covers agricultural products and foodstuffs closely linked to the geographical area. At least one of the stages of production, processing or preparation takes place in the area

Protected Designation of Origin (PDO) A designation by the EU which covers agricultural products and foodstuffs which are produced, processed and prepared in a given geographical area using recognized know-how

Radio Frequency Identification (RFID) Tag- A round tag used in Cattle for traceability purposes consisting of a microchip and passive radio transmitter with a unique number encoded on it.

SEIIC - Translated from Spanish, Electronic Information System of the Meat Industry, Argentina Traceability system

Tenderness - In meat, a major factor affecting the eating experience of a piece of meat. The lack of toughness when eating meat.

Traceability - The ability to follow the trail of, track down or to study and follow the development of something.

Traditional Specialty Guarantee (TSG) A designation by the EU which highlights traditional character, either in the composition or means of production.

Wet market - In Asia, a market for selling fresh meat and produce. It is different from a market that would sell durable goods often referred to as a dry market.

Waygu- A Japanese word translated literally as Japanese cow, refers to several breeds of cattle, who are genetically predisposed to intense marbling

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13.0 Appendices

13.1 List of Interviews

This list is as complete as possible and I apologize to those of you who's name I did not fully record. It was not intentional in any way. Thank you to everyone who helped me along the way.

Argentina, July 2015

Pacin, Fernando. Consultant, General Madrid.
SENASA Office, General Madrid.

Australia, April 2015

Graham, Ben. Future Farmers Network, Sydney, New South Wales.
Mann, Nicky & Wade. 2014 Nuffield Scholar, Woongarrah, New South Wales.
Meramist Pty, Ltd, Caboolture, Queensland.
Morley, Phil. CEO, Certified Australian Angus Beef, Gordon, New South Wales.
Parnell, Peter. CEO Angus Society of Australia, Armidale, New South Wales.
Prendergast, Mick. Manager, National Livestock Identification System Ltd. Fortitude Valley, Queensland.
Severin, Lyndee, Ashley and Peter. Owners, Curtain Springs Cattle Station, Northern Territory.

Brazil, June 2015

Agropecuária HR. São Paulo
Brazil Agricultural Research Corporation, EMPRAPA.
Fazenda do Pingado, Guzolândia, São Paulo.
Frigorifico Terra Do Boi, Auriflama, São Paulo.
Jacob's Citris, Bebedouro, São Paulo.
Manfirm, Pablo. Nuffield Brazil. Auriflama, Sao Paulo.

China, May 2014

Besseling, Ron J. CEO/Owner, KTBA, The Netherlands. SIAL Food Show, Shanghai.
Jeff, East Rock Farm Technologies Co. Ltd, Beijing.
Li, Mr. East Rock Farm Technologies Co. Ltd, Qingdao.
Shao, Charles. Chairman, Huazia Dairy Farm. Sanhe, Hebei.
Su Hao, James. Managing Director, East Rock Farm Technologies Co. Ltd, Beijing.

Zhang, Rachel. Manager, Operations, Canada Beef International Institute, SIAL Food Show, Shanghai

France, August 2014

Gerard, Myriam. Sales & Administration, Allflex, Vitré.

Hager, Kim. Beef Nutritionist, CHS Nutrition, USA. Alltech 500 Conference & Beef Tour. Normandy

Iyer, Anand Ramakrishnan. Asia- Pacific Web Specialist, Alltech, Alltech 500 Conference & Beef Tour. Normandy

Kennington, Lance R. Beef Nutritionist, CHS Nutrition. USA. Alltech 500 Conference & Beef Tour. Normandy

Phelps, Mark. Editor in Chief, Queensland Country Life, Australia. Alltech 500 Conference & Beef Tour. Normandy

Yeast, Ty. Managing Director, Alltech Canada. Alltech 500 Conference & Beef Tour. Normandy

Ireland, August 2014

Delaney, Mary & David. 2014 Nuffield Scholar. Killkenny.

Moyle, Tommy. 2014 Nuffield Scholar. Cork.

Ring, Lisa. Herd Plus. ICBF. Bandon.

Smith, Charles. General Manager, Irish Aberdeen-Angus Producers Ltd, Longfield, Virginia Co. Cavan.

United Kingdom, August 2014

Dunbia, Dungannon, Tyrone, Northern Ireland.

Fitzpatrick, Gemma. Senior Campaigns Officer, National Farmers Union.

Green, Ed. 2013 Nuffield Scholar.

Machala, Sharon. Taste of Ulster, Food NI Ltd. Belfast.

Pennock, Richard. 2014 Nuffield Scholar, York.

Uruguay, July 2015

Houghton, Ross. Owner Los Principios de Laurelito S.A, Flores.

13.2 Comparison Chart - Traceability Systems around the World

Country	Name of Program	Governing body	Official ID	ID available from	Numbering System	Data submitted by cow/loaf producer	Health data recorded	Additional Data recorded	Online or paper based	Reason for bringing it in	Who applies tags and when?	Notes
Australia	National Livestock Identification System (NLIS)	State Governments	EID; 9 or 10 approved tags	retailers but not on shelf all special orders about \$2.88 USD/tag	Herd ID built into tag number			mandatory move in/out at each step,	Online but animals travel with paperwork (per load)	Marketing (EU) and food safety	cow/loaf producer	NLIS goes to kill floor then plants have own system that is crossreference d; mandatory in 2006
Argentina	GENASA	SIGSA (government)	2 tag system - EID and visual Ailflex tags	\$1.50 USD/tag from local office	Company ID, Premise ID, Region all built into tag number	tag number, date of birth, sex	Vaccines		Online and in person at regional offices		producer before weaning	
Brazil		Database is state run and reports to Federal Govt	No ID required, inventory based tracking	n/a		-number of bulls, heifers and date of vaccinations given	Brucellosis and XXXX fever vaccines		Both, electronic database and paper copies travel with trucks	track vaccines given	n/a	
Canada	Canadian Cattle Identification Program (CCIP)	Board of Directors from industry groups	EID - 6 approved tags from various manufacturers	licensed and approved dealers, CCIA directly	Country code (124) and 9 digit unique number	date of birth, sex, breed (voluntary)	n/a		both	disease outbreak control	producers before leaving the farm of origin	
France			2 tag Visual (barcode) tag, Ailflex	Regional Department of Agriculture	Herd ID built into tag number				online			COOL required at restaurant level across Country
Ireland		Government	EID									
United Kingdom		Government	2 tag Visual (barcode) tag, EID available and soon to be mandatory, Ailflex		Herd ID built into tag number				Paper "passport" follows animal to each owner			Data stay with carcass after kill and through to sale to consumer, "born in" and "raised in" data required by govt
Uruguay	National Livestock Information System (SNIG)	INAC - The National Meat Institute	2 tag system - EID and visual Ailflex tags	Government at no cost	Company ID & Premise ID	tag number, date of birth, sex, breed	FMD and Brucellosis vaccines	all movements, change of ownerships	online	keeping export markets after FMD outbreak	prior to 6 months of age	12 digit number (country code 858+9 digit individual ID

13.3 Agriculture in China & Kazakhstan

Having the opportunity to visit both China and Kazakhstan as part of my Nuffield journey was an experience of a lifetime. These countries have emerging economies and emerging agriculture industries. I want to describe my experience in both these countries briefly as they are areas where most people have not been and it did not fit anywhere else in my report.

China

China was such an interesting place to visit within the context of Nuffield but it is hard to truly wrap my head around what will happen there in the next ten years. Their middle class is growing; this includes farmers like the ones I met. With this growth there are greater demands put on the quantity and quality of food needed; at the same time cities are growing and overtaking quality farm land. Problems not unique to China but which are amplified by having 1.34 billion people living in a country that is about 300,000 square kilometres smaller than Canada (by comparison the population of Canada is only 34.6 million people). 2,500 people every hour are leaving the Chinese countryside and moving to cities; where jobs are higher paying, more plentiful and working conditions are deemed superior. No other country in the world is dealing with migration issues such as this, ultimately putting further strain on the food demand as these people no longer produce any food for their own consumption relying entirely on purchased products.

Innovative, young farmers are seizing the opportunity and working hard to produce commodities that meet the needs of an ever growing urban population. I visited one large dairy farm, which is one of many milking tens of thousands of cows. The Huaxia Farm milks 70 000 cows in total spread over a number of barns and properties. The owner, a Chinese-American from California who sold his dot com company, less than ten years ago, went into the dairy business. He had the vision to see the need for milk products produced in China to decrease the reliance on imported product. The operation started with 180 cows and has grown to this size through venture capital funding and the ability to import live heifers from New Zealand and Australia. Further expansion is currently underway with a new barn being built near Shanghai. The barns are built using North American designs and the entire operation has been developed with an American production system in mind. The milk produced from one barn which holds 3,400 cows who are milked three times a day using a DeLaval rotary parlour, is sold as fresh milk and drinkable yogurt under their own farm brand, Wonder Milk. The rest of the product is sold to four different processors. There are plans to increase their own brand and begin a home delivery service in Beijing.

Feed is sourced both locally and from the United States. Alfalfa is sourced from California, bought and shipped to the farm for approximately \$450 USD a tonne. This is actually cheaper than bringing hay over land from growing areas within Mongolia, not because of bad roads or high fuel costs but the abundance of toll roads drives the cost through the roof. Corn

silage is sourced from a number of different smaller farms in a fifty mile radius. Bedding is also sourced within China and is rice hulls; these come in bags and have to be opened, emptied and stored in bunks.

More commonly are 100 - 200 cow dairy farms like the one which Mr. Li my host one day in Qingdao operated. Again the model is the North American style dairy barn and aside from outdoor free stall housing, his set up would have fit in very well on any Canadian dairy farm. The cattle were similar to what the average dairy farm here would have and while milk production is slightly behind the Canadian average it is not too far away. These producers see the opportunity and the need to produce food in China for the Chinese consumer. There are still small scale farms further out in the countryside where corn is planted, harvested and milled by hand and I was able to walk through one of these farms on my way down from a hike along the Great Wall of China. Traditional agriculture appeared to be going strong but it will not be long before these farms also become obsolete thanks to the modernization of agriculture in the country.



Figure 14: Milking at Huaxia Dairy Farm, with Mr. Li in his freestall and corn in the shadow of the Great Wall (l-r)

The Chinese government seems genuinely concerned regarding how they are going to feed their population in the future and they are working towards solutions, including buying foreign land and working towards Free Trade Agreements with food exporting countries. At the same time from what I saw, the government is not doing enough to nourish agriculture on home soil. Farmers, businesses and investors are taking it upon themselves to build a modern agriculture industry. They have come a long way but will it be enough? How can they continue to farm land that is leased from the government in 70 years increments? Can they keep healthy, productive soils when manure application is restricted? How sustainable is it to continue to import alfalfa from the United States? How will the horrific pollution problem affect the health of their animals and the ability of the plants to photosynthesize in the future? I look forward to watching how agriculture in Asia evolves and grows in the future and I hope to go back in ten years or so and see the progress. China should not be underestimated for their ability to produce a large amount of their own food and begin to rely less on imported food.

Kazakhstan

I was asked to participate in an Alberta Trade Mission to Kazakhstan in the summer of 2014 for my employer which I tied into a Nuffield trip to the European Union. Kazakhstan is a large Central Asian country located south of Russia and landlocked between China to the east and Uzbekistan and Kyrgyzstan to the south. Sitting on similar latitude as Southern Alberta and having a large oil industry, the two regions have been working together for a number of years as Alberta assists Kazakhstan in establishing their agriculture industry. Infrastructure including fencing, equipment, trained professionals and processing facilities are almost non-existent. The national cow herd is comprised of mainly native breeds; Alatau and Kazakh Whiteface. Since producers in the country began importing Angus and Hereford cattle from Canada, Australia and the United States there is now a few of these breeds scattered around the country. Many of these imported cattle however only have one calf or are left not bred to be harvested for beef.

People are keen to raise beef cattle and the dairy farms that we visited on the trip also appeared to be doing quite well. Like China, there is a need to supply the country with fresh milk and rely less on imports. The dairy industry does seem to have a better foot hold in the country than the beef industry does. The lack of practical knowledge is a real obstacle that the country will need to overcome. Locals and Government have been working with Consultants and professionals from across North America to train Kazakh people in these areas.

Kazakhstan has an emerging agriculture industry that has the potential to be a powerhouse on the International scene. This is another country that I would like to revisit in the future and see how they have evolved. They have challenges of their own but hopefully they can overcome the obstacles and build a strong, thriving industry utilizing all their natural resources.



Figure 15: Countryside of Kazakhstan, a large dairy farm, opening ceremonies at an auction all near the town of Kostanay (l-r)

13.4 Product of Canada Guidelines

Taken directly from the Canadian Food Inspection Agency Website for Comparison Purposes - October 13, 2015

<http://www.inspection.gc.ca/food/labelling/food-labelling-for-industry/origin/eng/1393622222140/1393622515592?chap=5>

The guidelines for "Product of Canada" and "Made in Canada" claims promote compliance with subsection 5.(1) of the Food and Drugs Act and subsection 7(1) of the Consumer Packaging and Labelling Act, which prohibit false and misleading claims.

The use of "Product of Canada" and "Made in Canada" claims is voluntary. However, once a company chooses to make one of these claims, the product to which it is applied should meet these guidelines.

The guidelines for "Product of Canada" and "Made in Canada" claims apply to foods sold at all levels of trade, including bulk sale or wholesale foods for further processing. They also apply to claims made in advertising and by restaurants.

These guidelines do not apply to:

- Products destined for export markets: These products must continue to meet the requirements of the importing country. This could result in different labels for domestic and exported products.
- Other consumer goods such as animal feed, agricultural seed or plants that are not food products: These products may be assessed under the Competition Bureau's Guide to Made in Canada Claims.
- Content claims regarding regional or provincial content, such provinces, cities, towns, etc.
- Terms or references that have regulated requirements and are not subject to the guidelines (e.g. grade names, references to Canada Organic or mandatory country of origin labelling).

All ingredients and their components that contribute to the food, regardless of their generation when they were added, must be considered when assessing "Product of Canada" and "Made in Canada" claims.

"Product of Canada" Claims

A food product may use the claim "Product of Canada" when all or virtually all major ingredients, processing, and labour used to make the food product are Canadian. This means that all the significant ingredients in a food product are Canadian in origin and that non-Canadian material is negligible.

The following circumstances would not disqualify a food from making a "Product of Canada" claim:

- a Very low levels of ingredients that are not generally produced in Canada, including spices, food additives, vitamins, minerals, flavouring preparations, or grown in Canada such as oranges, cane sugar and coffee. Generally, the percentage referred to as very little or minor is considered to be less than a total of 2 per cent of the product.
- b Packaging materials that are sourced from outside Canada, as these guidelines apply to the Canadian content and production or manufacturing of the food product and not the packaging itself.
- c The use of imported agricultural inputs such as seed, fertilizers, animal feed, and medications.

For example, a cookie that is manufactured in Canada from oatmeal, enriched flour, butter, honey and milk from Canada, and imported vanilla, may use the claim "Product of Canada" even if the vitamins in the flour and the vanilla are not from Canada.

The claim "Canadian" is considered to be the same as a "Product of Canada" claim and any product carrying this claim must meet the criteria for a "Product of Canada" claim described above.

Generally, products that are exported and re-imported into Canada would not be able to make a "Product of Canada" claim.

The only exception would be if the product:

- meets the "Product of Canada" criteria, and;
- is ready for sale when it leaves Canada (fully packaged and labelled) and is subsequently returned to Canada without undergoing any processing, repackaging or re-labelling (e.g. perhaps because of an ordering error).

This is because all content, processing and labour still occurred in Canada.

"Made in Canada" Claims with a Qualifying Statement

A "Made in Canada" claim with a qualifying statement can be used on a food product when the last substantial transformation of the product occurred in Canada, even if some ingredients are from other countries.

Substantial Transformation

A substantial transformation occurs when a food product undergoes processing which changes its nature and becomes a new product bearing a new name commonly understood by the consumer.

For example, the processing of cheese, dough, sauce and other ingredients to create a pizza would be considered a substantial transformation.

Processes which result in a substantial transformation may be outlined in more specific legislation, such as the Meat Inspection Regulations and Processed Products Regulations.

Qualifying Statement

If the "Made in Canada" claim is used, it must also include a qualifying statement to indicate that the food product is made in Canada from imported ingredients or a combination of imported and domestic ingredients. The qualifying statements that can be used include "Made in Canada from domestic and imported ingredients" or "Made in Canada from imported ingredients".

All variations of "Made in Canada" claims must include a qualifying statement.

For example, a claim such as "Proudly Made in Canada" would need a qualifying statement if the product contains imported ingredients as this claim includes the phrase "Made in Canada".

Made in Canada from imported ingredients

When a food is made with ingredients that are all sourced from outside of Canada, the label would state "Made in Canada from imported ingredients".

For example, a cookie manufactured in Canada from imported flour, oatmeal, shortening and sugar may be labelled or advertised with the claim "Made in Canada from imported ingredients".

Made in Canada from domestic and imported ingredients

When a food contains both domestic and imported ingredients, the label would state "Made in Canada from domestic and imported ingredients". This claim may be used on a product that contains a mixture of imported and domestic ingredients, regardless of the level of Canadian content in the product.

For example, a cookie manufactured in Canada using Canadian flour, oatmeal and shortening and imported sugar may be labelled or advertised with the claim "Made in Canada from domestic and imported ingredients".

To provide clarity and consistency for consumers, when a company chooses to use the Made in Canada claim, the qualifying statement should be presented in a standard format: "from domestic and imported ingredients". However, it would be considered acceptable if the order were reversed, if there were a higher proportion of imported ingredients than domestic ingredients.

The claim "Made in Canada from domestic and/or imported ingredients" is not permitted as it does not provide meaningful information to the consumer about the Canadian content.

Other Domestic Content Claims

The use of "Product of Canada" and the qualified "Made in Canada" claims are encouraged to ensure clarity for the consumer and to enhance their ability to identify Canadian made foods. However, other more specific statements or claims that describe the Canadian value added may be used without further qualification, provided they are truthful and not misleading for consumers.

Examples of these types of domestic claims include:

- "Roasted and blended in Canada" to describe coffee since the coffee beans are always imported;
- "Distilled in Canada" to describe bottled water that was distilled in Canada;
- "Canned in Canada" to describe green beans that were canned in Canada;
- "Refined in Canada" to describe imported cane sugar which has been refined in Canada;
- "Processed in Canada" to describe a food which has been entirely processed in Canada;
- "Prepared in Canada" to describe a food which has been entirely prepared in Canada;
- "Packaged in Canada" to describe a food which is imported in bulk and packaged in Canada.

Guidance on other types of commonly used domestic content claims can be found below:

Claims Identifying a Canadian Food or Canadian Ingredients

The claim "Canadian" is considered to be the same as a "Product of Canada" claim. As such, all or virtually all major ingredients, processing, and labour used to make the food product must be Canadian. For example, the claim "Canadian" on a container of frozen lasagna would mean that the food meets the "Product of Canada" criteria.

This criteria also applies when the claim is used to describe an ingredient within the food. For example, if the claim "Canadian cheddar cheese" is used on a package of cheddar cheese sauce, all or virtually all major ingredients, processing, and labour used to make the cheddar cheese in the sauce must be Canadian.

When this type of claim is used to describe a single component ingredient within the food, all of the ingredient(s) and, if any, derivatives of that ingredient in the food, must be Canadian. For example, if the claim "Contains Canadian blueberries" is used on a prepackaged blueberry pie, all of the blueberries, as well as any blueberry juice concentrate or derivative, must be Canadian.

"100% Canadian" Claims on Foods or Ingredients

When the claim "100% Canadian" is used on a label, the food or ingredient to which the claim applies must be entirely Canadian rather than "all or virtually all" Canadian.

For example, if the claim "100% Canadian" was used on a pot pie, all of the ingredients, processing, and labour used to make that product must be Canadian.

This would be the same case for a food with a claim which refers to the origin of a particular ingredient, whether single or multi-component, as being "100% Canadian".

For example, if the claim "Made with 100% Canadian Wheat" is used on a bag of dry pasta, all of the wheat, and its derivatives, used in that product must be Canadian.

Additional guidance on the use of the claim "100% Canadian Milk" can be found in the Guidelines for the Acceptable Use of "100% Canadian Milk" Claims on Dairy Products.

Multiple Country of Origin Claims That Reference Canada

The use of a voluntary multiple country of origin statement that references Canada (e.g. "Product of Canada and United States") would not be acceptable. Products that contain foreign ingredients, regardless of their source, are not eligible to bear a "Product of Canada" claim. Declaring multiple countries of origin on the label could result in false information and, as such, could be considered false and misleading.

Although products that contain foreign ingredients are not eligible to bear a Product of Canada claim, they may be eligible to make a qualified Made in Canada claim, provided that the last substantial transformation of the product occurred in Canada.

A blended claim, such as "A blend of Canadian (naming the product) and [Naming the country] (naming the product)", may be considered acceptable (e.g. "A blend of Canadian and American soybean oil").

Separate requirements may exist for commodities that require a country of origin statement. These are summarized in the Food-Specific Labelling Requirements of the Industry Labelling Tool.

Commodity Specific Information

Meat and Poultry

"Product of Canada" claims can be applied to meat from Canadian animals that are slaughtered in Canada. Animals are considered Canadian if they are born or hatched, raised and slaughtered in Canada or, in the case of feeder cattle, if they have spent a period of at least 60 days in Canada prior to slaughter in Canada. The 60-day residency period is based on international animal health standards. Such animals are fed, raised and slaughtered in Canada according to Canadian requirements.

The Canadian Food Inspection Agency (CFIA) is currently reviewing how these guidelines can be best applied to meat products from live animals imported into Canada. This review will determine how to apply the Product of Canada claim to meat products while respecting the principles of the "Product of Canada" guidelines and not disrupting international commerce or be contrary to trade rules.

Meat from imported hatching eggs, including those hatched in transit, would meet the "Product of Canada" guidelines provided that the chick was raised, slaughtered and processed in Canada.

Fish and Seafood

Wild fish and seafood products can be labelled Product of Canada when caught by vessels in Canadian waters (or adjacent waters as per Canadian regulatory fishing quotas) and the products from the fish and seafood are processed in a Canadian establishment using Canadian ingredients.

In the case of farmed fish and seafood, the farm must be located in Canada, and the processing must occur in a Canadian establishment with the use of Canadian ingredients.

Dairy and Eggs

Eggs from imported hens and milk from imported cows would qualify for the Product of Canada claim provided that the hen laid its eggs in Canada, and the cow is milked in Canada.

13.5 Private Traceability Systems in Canada

This is a list of all programs I currently am aware of in the Fall of 2015, if there are others that I have missed. I did not intend to exclude them.

Beef InfoExchange System

bixs.cattle.ca

bioTrack/bioLinks

www.biotrack.ca

Commercial Angus Identification & Performance Program

www.cdnangus.ca

ei ei eat

eieieat.com

ITS Global

www.itslivestock.com

Traceback

www.cowcalfhealth.com