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The Value of Food Certification and Labels for Consumers in Québec (Canada)

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PROJECT REPORT

PR

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Project report

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Executive Summary

CONTEXT AND OBJECTIVES

Consumers' habits regarding food are evolving. They are increasingly concerned about the impact of their diet on their health, but also on the environment and on the condition of the producers' lives. Recent scandals regarding the agri-food industry and recurrent outbreaks of foodborne illness have also undermined the consumers' trust in the quality of the food they buy. Globalization of the food supply chain and the increasing amount of processed food products make this judgment even more difficult. The development of label claims and certifications by the industry is intended to meet the new consumers' expectations and help them in their decision-making.

The main objective of this study was therefore **to assess the value of food certification and label for consumers**. To achieve this goal, a quantitative methodology based on a **questionnaire** has been developed. The survey has been designed based on the literature as well as consultations with key stakeholders from the agri-food industry. It covers three research themes: **1) perceptions and consumer behaviour, 2) knowledge of the certification process and the potential for certification development and 3) use and influence of information sources**. Administered by a polling and market research collaborator in January 2018, the questionnaire has been answered by **a representative sample of the population (N = 1032).**

PERCEPTION AND CONSUMER BEHAVIOUR

Highlighting the important issue of **transparency and traceability**, it is suggested in this report that consumers in Quebec mainly use directly accessible information to judge food quality. Indeed, **the ingredients listed on packaging** is the element that reassures the largest proportion of the respondents (47%). The two other elements are **the local origin of the product** (45.2%) as well as **the presence of an official seal of quality** (33.5%).

This latter element is the one presenting the biggest increase in the last two years, as 10% more respondents in 2018 than in 2016 said they were reassured by the presence of a label.

Regarding claims, those referring to **sourcing value and chemical free are among the most important for the consumers**. **66% of Quebeckers consider the claim "Locally grown" as fairly to very important** while this proportion is 60% for "Antibiotic free" or "Hormone free" products. Interestingly, some statistically significant variations are observable among respondents regarding the importance given to the claims "locally grown". Indeed, **52% of respondents' over-54s are reassured by the local production of the product, against 41% of those under 54. Moreover, 73% of over-54s consider the "local product" claim to be very important compared to 62% of those under**. The importance given by the respondents to claims referring to lifestyle value illustrates **the potential for continued growth in market share for organic, fair trade and GMO-free products**. For example, 35% of consumers consider the claim "organic" as fairly to very important proportion while organic products represent only about 5% of the total food market in Canada.

These results are confirmed by the analyses of purchasing intentions and willingness to pay for specific certifications, which have shown respondents' interest in local products, but also GMO free and organic ones. Indeed, while a large proportion of the respondents have already changed or would change their behaviour and are willing to pay more for the certification "Aliments du Québec" (change of behaviour (CB) 68%, willingness to pay (WTP) 48%), a significant part would do the same for "GMO-free" (CB 44%, WTP 27%) and "Organic" (CB 36%, WTP 27%) certifications. **The WTP remain however relatively weak except for the certification "Aliments du Québec".**

Interestingly, **the cost of groceries does not seem to influence the behavioural intentions** of the respondents regarding any of the analysed certifications. **The willingness to pay is not either affected by household income, neither in average nor for certifications taken independently. Individuals with higher levels of education are though slightly more willing to pay for organic certifications, independently of the level of family income.**

The importance of **perceived risks, trust and personal values as driving forces of purchasing behaviour** for these certifications is also supported by several results. For example, the intention that the individuals have to change their purchasing behaviour toward specific certification appears to be more strongly influenced by other- and environment-oriented values (suche as animal welfare, production methods, working conditions, local economy, etc.) than self-oriented values (such as healthy weight, food safety, etc). Also, only the change of purchasing behaviour regarding the certification "Aliments du Québec" is correlated with trust in some elements and actors of the agri-food system, especially in food producers.

CERTIFICATION PROCESS AND DEVELOPMENT OF CERTIFICATIONS

This report also highlights the importance to consumers that a claim is certified by an independent organization (third-party certification), especially when perceived risks and values are driving forces of their purchasing behaviour. 53% of the respondents consider that there are currently not enough food certifications and 88 % of them estimate as moderately to very important for a claim to be certified by an independent body. When part of an adequate control system, third-party certifications can indeed be **a token of trust for the consumers**, as well as an **effective tool of proactive risk management** for the organization benefiting from it.

However, despite the apparent importance and the value given to third-party certifications, **the issue of consumer education** on certifications control mechanisms clearly emerges. Indeed, respondents seem confused about the certification control mechanisms, as no clear opinion stands out for any type of claim. However, **the more the control mechanism of a certification is perceived to be binding, the more the corresponding certification is perceived as credible.** Also, 74% of the respondents consider the credibility of the certifying body as very or fairly important when judging the credibility of a certification. It appears to be the most important element. This has direct implication for certification development, as consumers who perceive that certifications are not supported by a strong control mechanism also tend not to judge as important for a claim to be third-party certified.

Conversely, respondents who give more importance to third-party certifications have a tendency to be more willing to have their purchasing intentions positively influenced by certifications.

CONSUMERS AND INFORMATION SOURCES

Finally, it is suggested that **making information available is probably not enough to address the issue of consumer education adequately.** For example, 54% of Quebeckers would certainly or probably not use a QR Code placed on a food product to acquire more information on the certification. However, **certification bodies are among the top 5 most consulted information sources about food-related issues**, before government. 21 % of Quebeckers consult them moderately to a lot. To face this timely yet enduring issue of consumer safety and education, a complex educative system should be put in place, in which certification organizations have surely an active role to play.

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Introduction

Consumers' habits regarding food are evolving. They are increasingly concerned about the impact of their diet on their health, but also on the environment as well as on the condition of the producers' lives and on animal welfare (Ringquist *et al.*, 2016; Sirieix *et al.*, 2013). Mixed with theses environmental and ethical issues, consumers are also concerned by local economy, which can explain the growing popularity of local food consumption.

In addition to this increasing awareness of the potential impacts of food consumption, consumers' trust in the agri-food industry as recurrently been undermined by food scandals. The 2013 horse meat, the 2017 eggs contamination scandals in Europe or the 2012 counterfeit vegetables in Ontario and other recurrent outbreaks of foodborne illness have also undermined the consumers' trust in the quality of the food they buy.

Consumers are therefore looking for more information about the nutrition, the composition, the methods of production of their food, or simply to be reassured about the quality of their food. The current development of label claims and certifications, especially regarding organic food, GMO-free, fair-trade or local products, is intended to meet these new expectations (Sirieix *et al.*, 2013; Tonkin *et al.*, 2015).

A strict and complex legal framework regulates label claims and food certifications in order to protect the consumers. Unfortunately, this framework does not guarantee the value of the claims and the certifications, neither for the consumers nor the industry. On the one hand, this complexity bears the potential for consumer deception (Fromer, 2017). As a matter of fact, in Quebec, only 29% of the consumers are quite or very confident in certifications or labels (de Marcellis-Warin & Peignier, 2017). On the other hand, it implies significant additional costs for the organization willing to certify its products and expecting to create competitive advantages (Jahn *et al.*, 2005; Norberg *et al.*, 2011; Walley *et al.*, 1999).

Focusing on the side of consumer perceptions, this study hence intends to assess the value of food certification and label for consumers in Quebec, Canada.

A focus on the province of Quebec is peculiarly interesting considering the importance of the agri-food sector in the local economy of the province as well as the significant proportion that Quebec's agriculture and food processing industry represents for the national agri-food sector (Antunes *et al.*, 2015).

To better understand the context of this study and to help analyse its results, the first part of this report presents the specificities of food certification in Canada and in Quebec, while reviewing key elements of the certification and accreditation process. Then, after explaining the methodology used in this research to meet our objective, in-depth analyses of the results regarding a) perceptions and consumer behaviour, b) knowledge of the certification process and the potential for certification development and c) the use and influence of information sources are presented. Finally, several recommendations are made in a concluding section.

1. Claims, certifications and designations

In Canada, food claims and certification are closely regulated by a strict legal framework at the federal level. However, some specificities can also be found at the provincial level, especially for the province of Quebec.

1.1. The federal level

1.1.1. Claims acknowledged by the CFIA

The Canadian Food Inspection Agency (CFIA) plays a central role in food labelling. In addition to regulating the use of logos and trademarks, the CFIA acknowledges several types of claims[1]: a) allergen-free, gluten-free and precautionary statements, b) composition and quality claims, c) health claims[2], d) method of production claims, e) organic claims, f) origin claims and g) nutrient content claims[3]. To avoid consumer deception, these claims must comply with the *Food and Drugs Act* (R.S.C., 1985, c. F-27) – especially art. 5(1) – and *Regulations* (C.R.C., ch. 870), as well as the *Consumer Packaging and Labelling Act* (R.S.C., 1985, c. C-38) – especially art. 7(1) – and *Regulations* (C.R.C., ch. 417). Put shortly, any claim must be accurate, truthful and non-deceptive, and can be made only if an appropriate verification process or system exists to confirm such claim. The CFIA regularly proceed to compliance and enforcement activities, during which claim substantiation are requested[4]. Such substantiation can be reached through third-party audit, valid documentation or non-government certification programs, for example.

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[1] See the food labelling tool for industry: http://www.inspection.gc.ca/food/labelling/food-labelling-for-industry/eng/1383607266489/1383607344939, consulted February, 2018.

[2] If the products is identified as a Natural Health Product rather than a Food, the Natural Health Products Regulations (SOR/2003-196) should apply. See http://www.inspection.gc.ca/food/labelling/food-labelling-for-industry/health-claims/eng/1392834838383/1392834887794?chap=3, consulted February, 2018.

[3] Nutrient content claims may be subject to specific requirements. For details, see http://www.inspection.gc.ca/food/labelling/food-labelling-for-industry/nutrient-content/specific-claim-requirements/eng/1389907770176/1389907817577, consulted February, 2018.

[4] http://www.inspection.gc.ca/food/labelling/food-labelling-for-industry/general-principles/eng/1392324632253/1392324755688?chap=0#s3c3, consulted February, 2018.

Certification is, however, mandatory for some claims regarding production methods, such as Kosher and Halal, for which the name or symbol of the certifying body or person must appear where the claim is made. Also, according to the *Canadian Organic Regime*, which is framed by the *Canada Agricultural Products Act* (R.S.C., 1985, c. 20 (4th Supp.)) and the *Organic Products Regulations, 2009* (SOR/2009-176), organic products sold in the international or inter-provincial market requires certifications from CFIA accredited bodies[5]. Such certifications are based on the CAN/CGSB 32.310, CAN/CGSB 32.311 and CAN/CGSB 32.312 Canadian Organic Standards[6]. Equivalencies have been adopted for organic products imported from the European Union, Japan, Switzerland and the United States. Finally, organic products sold in their province or territory of origin are not under the jurisdiction of the *Organic Products Regulations*, although their label still needs to be in agreement with the *Food and Drugs Act* and the *Consumer Packaging and Labelling Act*. British Columbia, New Brunswick, Manitoba and Quebec have, however, developed specific requirements for organic products.

Regarding genetically engineered foods, it is the responsibility of Health Canada to determine the safety of new products[7]. Specific labelling may be mandatory if there is health or safety concern for the consumers. Except this case, the labelling of genetically engineered foods is only on a voluntary basis but should follow the *Voluntary labelling and advertising of foods that are and are not products of genetic engineering* standard (CAN/CGSB-32.315-2004, Reaffirmed 2016). This standard has been developed according to the Codex Alimentarius International Food Standards, among others. Figure 1 below summarizes this legal framework.

[5] List of CFIA accredited certification bodies: http://www.inspection.gc.ca/food/organic-products/certification-and-verification/certification-bodies/in-canada/eng/1327861534754/1327861629954, consulted February, 2018.

[6] http://www.inspection.gc.ca/food/organic-products/labelling-and-general-information/regulating-organic-products/eng/1328082717777/1328082783032, consulted February, 2018.

[7] http://www.inspection.gc.ca/food/labelling/food-labelling-for-industry/method-of-production-claims/genetically-engineered-foods/eng/1333373177199/1333373638071, consulted February, 2018.

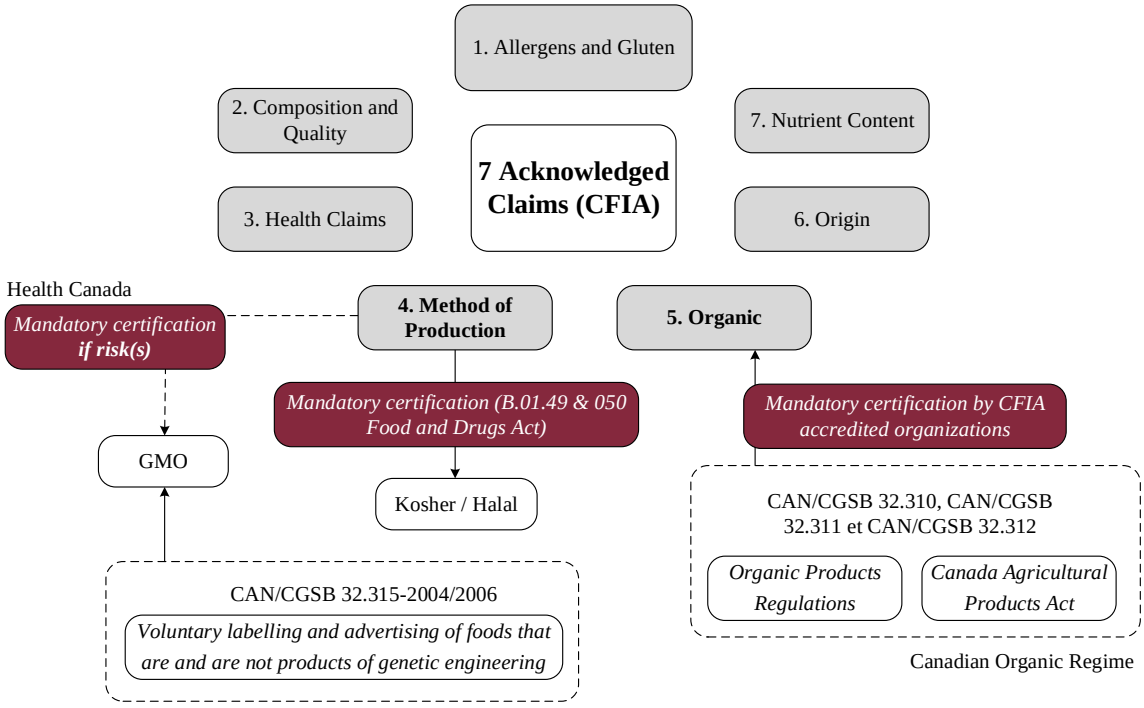

Figure 1. Legal framework regulating claims at the federal level.

1.1.2. Certification Marks

Therefore, except for the cases discussed above, it is not mandatory to certify a claim. Still, it is possible to create voluntarily a specific certification to strengthen a claim and gain consumer trust. As for any other claim, the use of the word “certified” or “approved” must be accurate, truthful and non-deceptive in agreement with the *Food and Drugs Act* and the *Consumer Packaging and Labelling Act*. In order to protect the consumer, and the certification itself, it is possible to register the certification as a certification mark. Indeed, at the federal level, the *Trade-marks Act (R.S.C., 1985, c. T-13)* acknowledges three types of trade-marks: the ordinary mark (distinctive name, sound and/or symbol for goods or services), the distinguishing guise (a distinctive shape of goods or their containers) and the certification mark.

A certification mark is detained by a person or an organism and is intended to be licensed to other persons or organizations for goods or services meeting a specific, predetermined,

standard defined by the owner[8]. The owner of the certification itself is not allowed to produce the good or provide the service. Certification can be made by the organism which holds the certification mark or by third-party certification bodies. Table 1 presents some examples of such certification marks. Applications for certification marks registration are filed to The Canadian Intellectual Property Office (CIPO) which is responsible for the administration and processing of these intellectual properties. However, once the application is approved, the protection of the registered trade-mark is the owner's responsibility.

[8] http://www.ic.gc.ca/eic/site/cipointernet-internetopic.nsf/eng/h_wr02360.html#whatAreTM, consulted February, 2018.

Table 1. Examples of certification marks and their logos in Canada	
1. "Fair Trade", "Fair Trade Certified" or "Certifié équitable" are certification marks held by *Fairtrade Canada* and certified by FLOcert. It is one of the most recognized fair trade label, although other fair trade labels such as the Small Producers' Symbol or the World Fair Trade Organization label – also certification marks – are gaining an increasing momentum (see Durochat *et al.*, 2015).	
2. The "Quality Milk" label is held by the *Dairy Farmers of Canada* organization as part of their Canadian Quality Milk (CQM) Program. The certification for this program is made by local validators accredited by a national program coordinator.	
3. "Miel 100% Québec" is a certification mark created in 2012 following a study revealing the potential of such label to promote the consumption and use of honey in Quebec: a honey certified "product in Québec" would have a higher value for about 53% of the respondents of the study and 69% would be willing to pay more for a honey with such a certification (see Jacques, 2009). This mark is held by the *Fédération des Apiculteurs du Québec* and certified by the Bureau de Normalisation du Québec (BNQ).	
4. The certification "True Source Certified" is intended to guarantee the traceability of the honey from to beekeepers to the consumer, mainly for the North American market. This certification is held by *True Source Honey, LLC* and certified by NSF International.	
5. "Terroir Charlevoix" is held by *La Table Agro-Touristique de Charlevoix*, a regional non-profit association of actors from the agri-food chain. This certification is intended to promote the origin and the quality of products from Charlevoix and is delivered by Concert, a division of Ecocert.	

1.2. Specificities at the provincial level: the example of the province of Quebec.

In Quebec, two government-related entities, the “Conseil des appellations réservées et des termes valorisant” (CARTV) and the “Conseil de promotion de l’agroalimentaire québécois” (CPAQ) supervise specific designations and certification marks.

1.2.1. The CARTV and the reserved designations

In 2006, the Ministère de l'Agriculture des Pêcheries et de l'Alimentation du Québec (MAPAQ), has enacted the *Act respecting reserved designations and added-value claims (A-20.03)*, replacing the previous *Act respecting reserved designations (A-20.02)* from 1996[9]. In the aftermath, the CARTV has been created in place of the Conseil des appellations agroalimentaires du Québec (CAAQ) in order to administer this new act. The CARTV acknowledges five categories of reserved designations:

- the Added-value claim;
- the Production method (Including BIO for organic products);
- the Designation of Specificity (AS) or Traditional Specificity (AST);
- the Protected Geographical Indication (IGP) and finally;
- the Designation of Origin (AO).

Figure 2 below illustrates the logic diagram for reserved designations and certification marks.

[9] http://legisquebec.gouv.qc.ca/fr/ShowDoc/cs/A-20.02, consulted February, 2018.

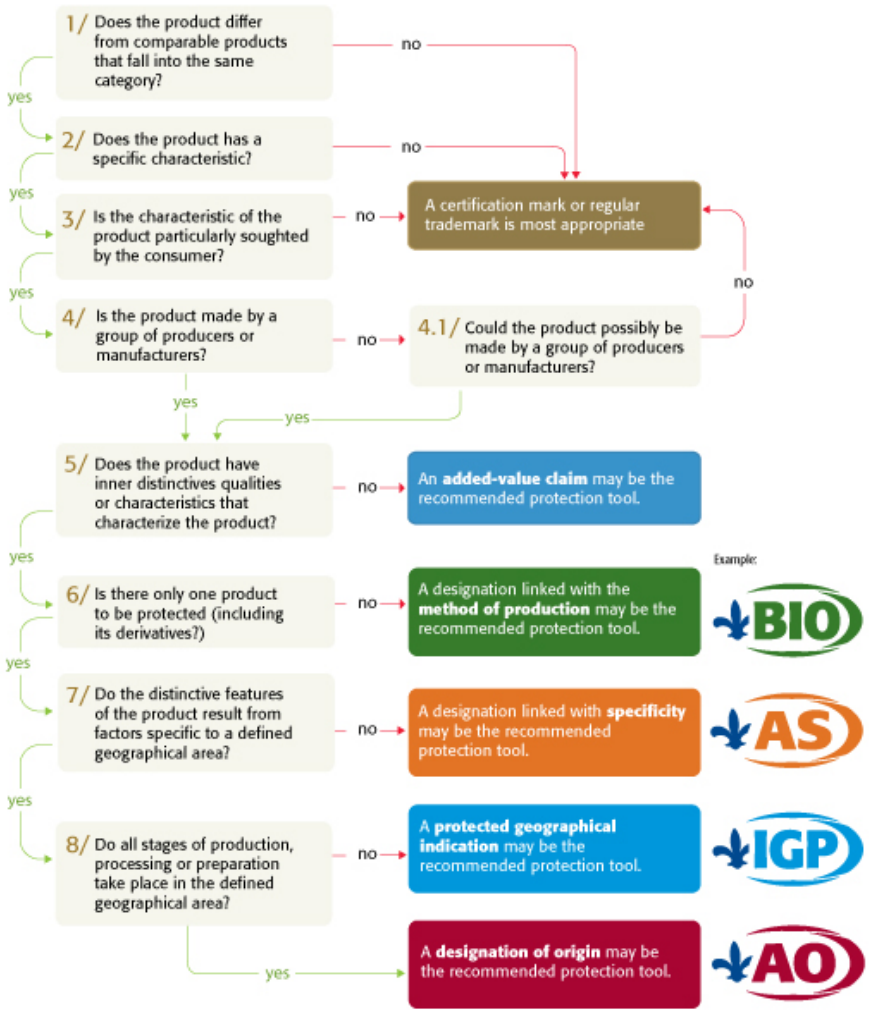

Figure 2. Logic diagram of the reserved designations (From Guide de demande d'autorisation d'un terme valorisant (CARTV, 2013a), in French)[10]

The Added-value claim "identifies a special characteristic of a product, generally a method of production or preparation, that is sought by the consumer"[11] (e.g. microbrewery beer, Artisan or Nordic product, etc.) and meets a specific standard developed for this purpose. The Production method designations acknowledge "a specific way of producing products that uses various new techniques and production constraints that go beyond current

[10] This English version of the diagram can be found directly on the site of the CARTV. See https://www.cartv.gouv.qc.ca/en/reserved-designation-logic-diagram, consulted February, 2018.

[11] http://www.cartv.gouv.qc.ca/en/added-value-claim, consulted February, 2018.

regulations"[12]. This designation covers organic certifications based on the same standards used by the *Canadian Organic Regime*. However, certification bodies for organic products sold within the province of Quebec have to be specifically accredited by the CARTV[13]. The AS and AST designation "focuses on a characteristic rather than on a specific region of origin"[14] whereas the IGP and AO designations refers precisely to a specific characteristic of the good attributed to its production region[15,16]. While all production operations must occur in the corresponding geographical location in the case of the AO designation, only the production stage giving the particularity to the good has to happen in the specific region for the IGP designation (CARTV, 2013b).

Unlike at the federal level, once the MAPAQ has accepted a designation or an added-value claim, it is under the protection of the CARTV which creates an adequate inspection and certification systems in cooperation with different control bodies. Besides organic designations, only five reserved designations are presently recognized by the MAPAQ[17]:

- "Neuville Sweet Corn" (IGP – controlled by Ecocert Canada);
- "Canadienne Cow Cheese" (AS – controlled by Ecocert Canada);
- "Québec Ice Cider" (IGP – controlled by QAI inc.);
- "Québec Icewine" (IGP – controlled by Ecocert Canada) and;
- "Agneau de Charlevoix (IGP – accreditation of the control body in process).

There are also two IGP, one AST and one Added-value claim applications currently under examination[18].

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[12] http://www.cartv.gouv.qc.ca/en/production-method, consulted February, 2018.

[13] For a list of accredited bodies see http://www.cartv.gouv.qc.ca/?q=organismes-certification-accredites-pour-mode-production-biologique-au-quebec, consulted February, 2018.

[14] http://www.cartv.gouv.qc.ca/en/designation-specificity-0 consulted February, 2018.

[15] http://www.cartv.gouv.qc.ca/en/protected-geographical-indication-pgi-0, consulted February, 2018.

[16] http://www.cartv.gouv.qc.ca/en/designation-origin-do-0, consulted February, 2018.

[17] http://www.cartv.gouv.qc.ca/en/register-quebec-recognized-reserved-designations, consulted February, 2018.

[18] Information details about CARTV and reserved designations since 2006 can be found in CARTV (2016), in French.

1.2.2. The CPAQ and the "Aliments du Québec" certification marks

Certifications currently in used that are not acknowledged as reserved designations by the CARTV, or imposed by the federal law, are then trade or certification marks such as the examples presented previously. In addition to those, the *Conseil de promotion de l'agroalimentaire québécois* (CPAQ), created in 1996 and mainly financed by the MAPAQ, holds two certification marks to promote the local agri-food industry: "Aliment du Québec" and "Aliments préparés au Québec". A product entirely from the province of Quebec, or with a minimum of 85% of its ingredients (including all main ingredients) from Quebec can be certified "Aliment du Québec" if all transformation and packaging stages are also made in Quebec. A product entirely transformed and packed in the province can be considered for the certification "Aliments préparés au Québec" (CPAQ, 2017).

These certifications, delivered and controlled directly by the CPAQ, have to be obtained for each product of an organization, and not for the organization itself. These certifications have a significant influence on the market. It has been shown that a product labelled "Aliments du Québec" increases its market share by 2.8% (Rodier, 2010). Specifically for this certification, it has also been shown to generate a better attitude toward to the product as well as an increase of the propensity to pay from the customer (Bernoussi, 2011).

Finally, in collaboration with the CARTV, the CPAQ has created two other certifications in 2013, "Aliment du Québec – Bio" and "Aliments préparés au Québec – Bio" to promote both the production method and the origin of the production or the transformation[19]. Since these certifications concern organic products, they need to be delivered by independent accredited organizations (ECOCERT and Québec-Vrai in this case).

Table 2. Certifications marks held by the CPAQ

ALIMENTS DU QUÉBEC	ALIMENTS PRÉPARÉS AU QUÉBEC	ALIMENTS BIO DU QUÉBEC	ALIMENTS BIO PRÉPARÉS AU QUÉBEC

[19] For details on these programs, see https://www.alimentsduquebec.com/fr/ and https://lequebecbio.com/

2. Certification and accreditation process

In Canada, as mentioned previously, no certification is mandatory for claims, with some exceptions. It is the responsibility of the industry to comply with the *Food and Drugs Act*, the *Consumer Packaging and Labelling Act* and their respective regulations. Claim justifications are, however, requested during the CFIA compliance and enforcement activities.

However, regarding organic claims, a certification has to be requested to control bodies, as such certification is mandatory. To issue organic certifications, control bodies must be accredited by the CFIA and the CARTV for the province of Quebec. Three organisms have been designated by the CFIA as Conformity Verification Bodies (CVB) to help accredit certification bodies: the Certified Organic Associations of British Columbia (COABC), the Committee on Accreditation for Evaluation of Quality (CAEQ) and the International Organic Accreditation Service (IOAS)[20]. The CAEQ, being an autonomous technical unit of the CARTV, acts as its designated CVB[21]. To be accredited, a potential certification body must comply with ISO/IEC 17065 :2012 standard. CVB assess applications for accreditation using ISO/IEC 17011:2004 standard and make recommendations to CFIA/CARTV for final decision. CVB themselves are subject to evaluation by the International Accreditation Forum through peer review based on ISO/IEC 17011:2004 standard[22]. Figure 3 illustrates this process.

For certification mark, once it has been created and registered, a certification request can be made to the owner of the mark – usually a producer association, as in the examples above –, to a designated delegate or directly to the certification body, depending on the

[20] http://www.inspection.gc.ca/food/organic-products/certification-and-verification/verification-bodies/eng/1327859896490/1327860150110, consulted February, 2018.

[21] http://www.cartv.gouv.qc.ca/en/committee-accreditation-evaluation-quality-caeq-0, consulted February, 2018.

[22] For details on the accreditation network and certification process for food safety in general, see http://www.inspection.gc.ca/about-the-cfia/accountability/consultations-and-engagement/regulatory-risk-based-oversight/private-certification-policy/eng/1452808755126/1452808821799?chap=13, consulted February, 2018.

mark. “Aliments du Québec” and “Aliments préparés au Québec” being certification marks, the process is the same, and requests to program adhesion and certification can be made directly to the CPAQ. For organic products, certification has to be made by a CFIA/CARTV accredited body (Ecocert and Québec-Vrai).

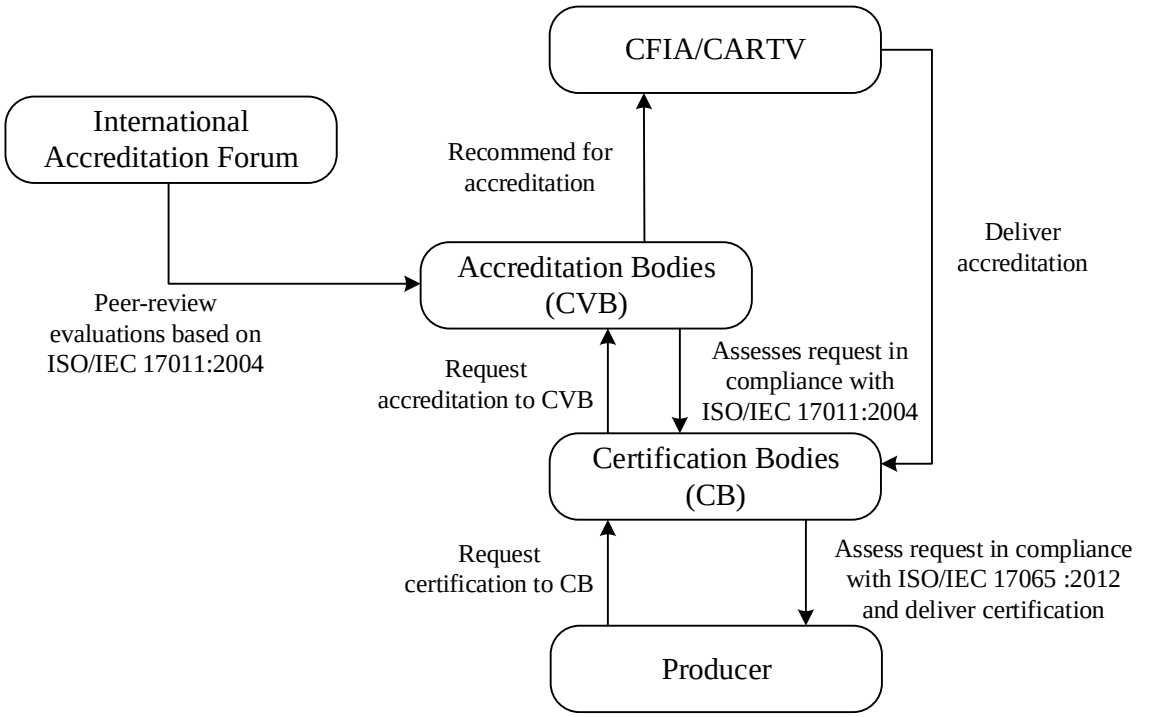


Figure 3. Accreditation and certification process

Finally, concerning currently acknowledged Reserved designations in Quebec, the process of certification is similar to certification mark or organic certification. A producer, manufacturer or distributor fill a request to the adequate certification body accredited by the CARTV following the previous process, which may deliver the certification after audits. The process of creation of reserved designation is, however, complex[23]. A request to create a reserved designation has to be made by a producer association to the CARTV, which relays the file to the MAPAQ. A committee is then created to assess the admissibility of the request and a team is designated for on-site visits. If admissible, the proposition of

[23] Guides for each reserved designations are available. See http://www.cartv.gouv.qc.ca/en/guides-and-publications, consulted February, 2018.

reserved designation is then submitted to public consultation before final recommendations to the Minister (CARTV, 2011). Figure 4 illustrates this process.

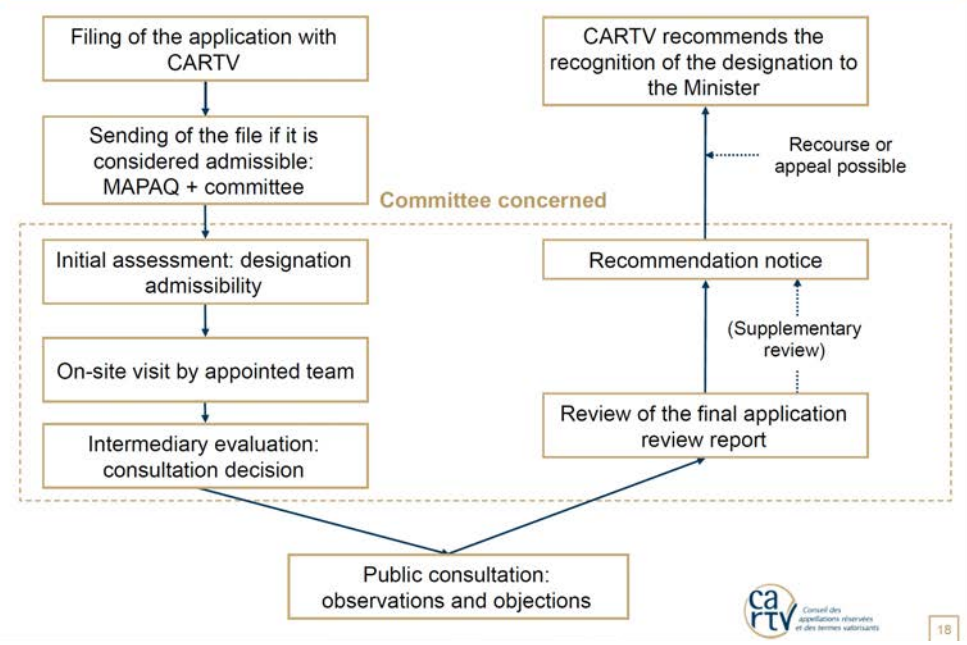


Figure 4. Processing of designation applications (from CARTV (2011))

3. Objectives and methodology of the study

As stated in the introduction, this study focuses on consumer perceptions and intends to assess the value of food certifications and labels for consumers in Quebec, Canada. To reach this goal, several research objectives have been identified and a specific methodology has been developed.

3.1. Research Objectives

Several research objectives have been identified and regrouped according to three research axes:

1. Perceptions and consumer behaviour

- To identify what the elements that reassure the consumers the most regarding food quality are, and what the claims that consumers value the most are;
- To assess what the levels of familiarity and credibility of major certifications and official seals are;
- To assess the willingness-to-pay and change of behaviour for major certifications.

2. Certification process and development

- To assess the level of knowledge of control mechanisms for different types of certifications;
- To assess the importance of certifications for consumers and to identify what are the most important elements used by consumers to assess certification credibility.

3. Consumers and information sources

- To assess the use and the influence of information sources.

3.2. Questionnaire design and validation

A quantitative approach based on questionnaires has been selected for this study. The questions and items composing our questionnaire have been designed based on a literature review and interviews with relevant stakeholders, including:

Agri-food processors

- 2 agri-food processors
- 1 representative from their professional association in Québec (Conseil de la transformation alimentaire du Québec - CTAQ)

Food distributors

- 1 food distributor
- 2 industry associations representing them (The Quebec Produce Marketing Association (QPMA) and the Association des Détaillants en Alimentation du Québec (ADAQ))

Opinion leaders of food issues in Quebec

- 2 key media influencers

Government agencies at different level (provincial and federal)

- 2 provincial public authorities: the Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec (MAPAQ) and Aliments du Québec
- 1 provincial public certification agency: the Committee on Accreditation for Evaluation of Quality (CAEQ) (CARTV)
- 1 federal public authority: Canadian Food Inspection Agency (CFIA).

An iterative analytical process within the research team has allowed the final questionnaire to be created, composed of 18 questions. Ten demographic variables have also been included, such as:

1) **Residential area**
2) **Gender**
3) **Age**
4) **Language**
5) **Level of education**
6) **Marital status**
7) **Professional occupation**
8) **Presence of minor children in the household**
9) **Presence of allergic or medical conditions influencing diet**
10) **Family income**

Two versions of the questionnaire have been developed, one in French and one in English. After final consultation with the stakeholders, the two versions have been reviewed and pre-tested by survey experts at our polling and market research collaborator (Léger-Marketing). This has allowed to verify that the questions were understandable in both languages and that the scales were appropriate.

3.3. Sampling and analytical strategy

Our sample is composed of 1032 individuals living in the province of Quebec (giving a 3.1% margin of error at a 95% confidence interval). They have been selected and contacted by the Léger teams using the quota and stratum method, thus assuring a robust representativeness of the population of Quebec. Demographic characteristics of our sample are presented in Annex A. Data have been collected from January, 4th to January, 9th 2018. The average completion time was 17.3 minutes. Finally, data have been weighted according to the demographic characteristics based on the 2011 Census data of Statistics Canada.

Results have been mainly analyzed using analysis of variance (ANOVA) to test the level of significance of the differences between respondents. Furthermore, relations between

different variables of interest have been analyzed using spearman's rank correlation tests. Details on how to interpret these results are given in Annex C.

In the next sections, an in-depth analysis of the results of this research will be presented. This analysis aims to meet each of our previously identified objectives and is structured following the three main research axes presented above:

- Perceptions and consumer behaviour (Part 4).
- Knowledge of the certification process and the potential for certification development (Part 5).
- Use and influence of information sources (Part 6).

This report ends with specific recommendations related to this analysis and concluding remarks.

4

Perceptions and consumer behaviour

Recent scandals regarding the agri-food industry and recurrent outbreaks of foodborne illness have undermined the consumers' trust in the quality of the food they buy. In this section, we first investigate what are the elements that reassure the consumer the most about food quality as well as the importance given to the most common allegations. Next, we analyze the level of familiarity and the perceived credibility of specific logos. We finally examine what are the certifications that have changed, or would change, consumer behaviour and willingness to pay.

4.1. Perceptions regarding food quality and food claims

4.1.1. Elements that reassure the most consumer regarding food quality

Respondents were first asked to choose a maximum of three elements they find the most reassuring regarding the quality of the food products they consume. Figure 5 below presents the proportion of respondents for whom the listed element is among the most reassuring ones regarding food quality.

3 elements that reassured the largest proportion of respondents:

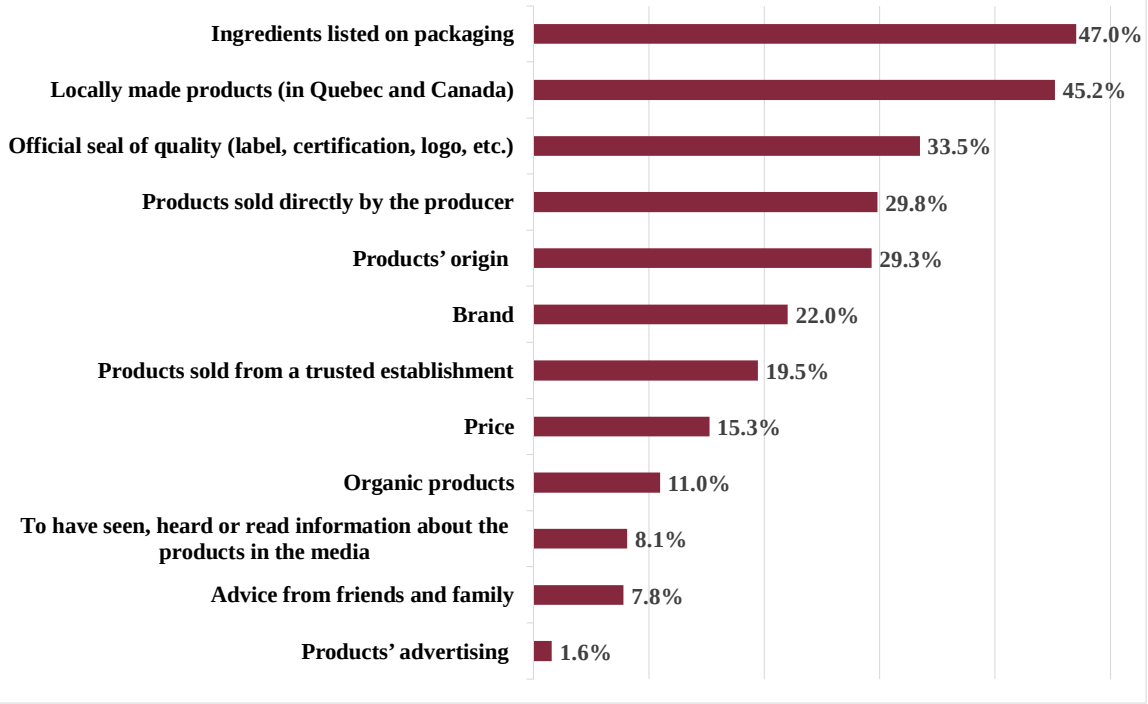
- **Ingredients listed on packaging**
- **Local origin of the product**
- **Presence of official seal of quality (label, certification...)**

We can observe that the two elements that reassured the largest proportion of respondents is the ingredients listed on the packaging and the local origin (Quebec or Canada) of the product. This underline the necessity to provide clear and non-deceptive information about ingredients and their traceability to restore consumer trust (Van Rijswijk & Frewer, 2012). The third element is of interest here, as it refers to official seals of quality, such as labels or certifications.

These results mean that consumers rely mostly on the information they can find directly on the product or its package to assess its quality, instead of considering indirect information

through media, advertisements or even close ones' advice (see bottom of Figure 5) which is coherent with previous studies (e.g. Van Rijswijk & Frewer, 2012). Finally, organic products are among the most reassuring element for a minority of the respondents only.

Figure 5. Proportion of respondents for whom the listed element is among the most reassuring ones regarding food quality (3 choices were possible)



These results are, however, not homogenous among the respondents. Women seem to be even more reassured by the list of ingredients than men (W-54% - M-40%, p=0.0001). Also, while the importance given to the local origin of the product varies mostly according to the age of the respondents – the older the respondent, the more reassured by the local origin – (18-44 years old: 37%, 45-75 years old and more: 52%, r_s =.14, p=0.0000), the language (French and English: 46%, Allophones: 33% p=0.02) or the metropolitan area (Quebec city MA: 33%, Montreal MA and other: 47% p=0.02) have a significant influence as well. Interestingly though, there is no significant demographic distinction for the existence of an official seal as one of the most recurrent elements of quality among the respondents.

Focusing now on the least selected elements, the value given to the opinion of relatives for the assessment of the quality of the food products also varies according to the age: older

respondents rely even less on the opinion of relatives that younger ones (18-44 years old: 12%, 35-75 years old and more-4%, r_s =-.17, p=0.0000), which make practical sense. However, there is no demographic variation for products' advertising.

Finally, it might be worth analyzing some variations among respondents regarding the selection of organic products as one of the most reassuring elements, especially considering the continuing expansion of this sector in Canada[24]. Younger individuals tend to place increased reliance on this aspect to assess quality of food products that older ones (18-44 years old: 15%, 45-75 years old and more: 9%, r_s =-.11, p=0.0004). Also, students are the ones having the more often selected this element compared to other respondents (Students: 26%, other: 11%, p=0.0000).

Characteristics of respondents who are reassured by the fact that the product is organic:

- **Younger people**
- **Student**
- **People living in urban areas**
- **People with higher education level**

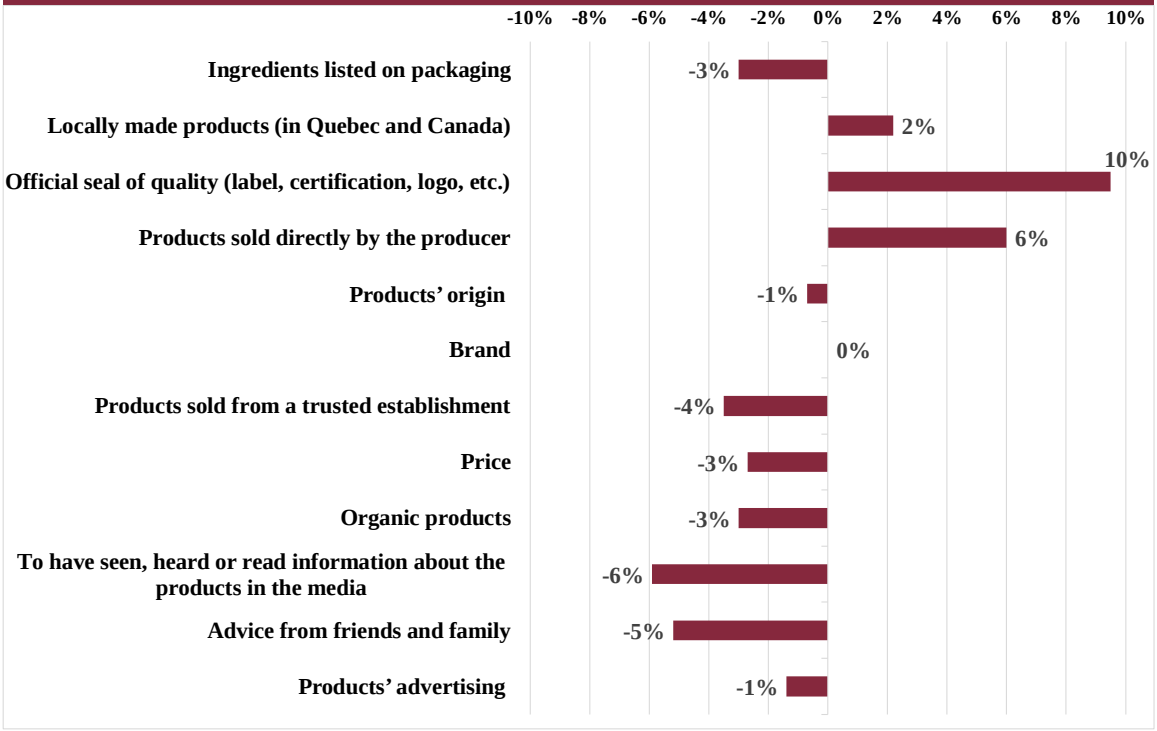
Similarly, people living in dense urban areas also seem to be a little more reassured by organic products than individuals living in the country side (Montreal and Quebec city MA: 13%, other area: 9% p=0.026). Finally, the opinion toward organic products seems to be influenced by the level of education of the respondents (primary and high school: 7%, college, associate's and bachelor's degree: 12% and master's and doctoral degree: 22%, p=0.014).

It is now interesting to look at the evolution between 2016 and 2018 of the proportion of respondents who are the most reassured, regarding food quality, by the proposed element. This evolution is presented in Figure 6. Results from 2016 come from a previous study regarding risk perceptions in Quebec (de Marcellis-Warin & Peignier, 2017)[25].

[24] See https://www.ota.com/canada-ota/what-cota-does/research-market-analysis, visited February 2018.

[25] Baromètre CIRANO. Data gathered in October 2016 from 1008 respondents.

Figure 6. Evolution, between 2016 and 2018, of the proportion of respondents who are the most reassured on food quality by the listed element



The largest increase observable is for the presence of official seals, such as certifications, followed by products directly sold by producers, which highlight again the increasing importance of transparency and traceability. On the other hand, one can observe that the largest decrease if for indirect information, from the media or from relatives. The place where the product is sold also lost a few points. It seems therefore that the place of purchasing is not that important, as long as a direct information about quality and traceability is available.

10% more respondents in 2018 than in 2016 said they were reassured by the presence of a label.

4.1.2. Most important claims for consumers

In order to investigate deeper consumer perceptions and value regarding food quality, a second question was designed with the objective to identify what are the claims that consumers value the most. Respondents were asked to rate the importance they give to 17 different types of claims (from 1- Not important at all, to 5- very important).

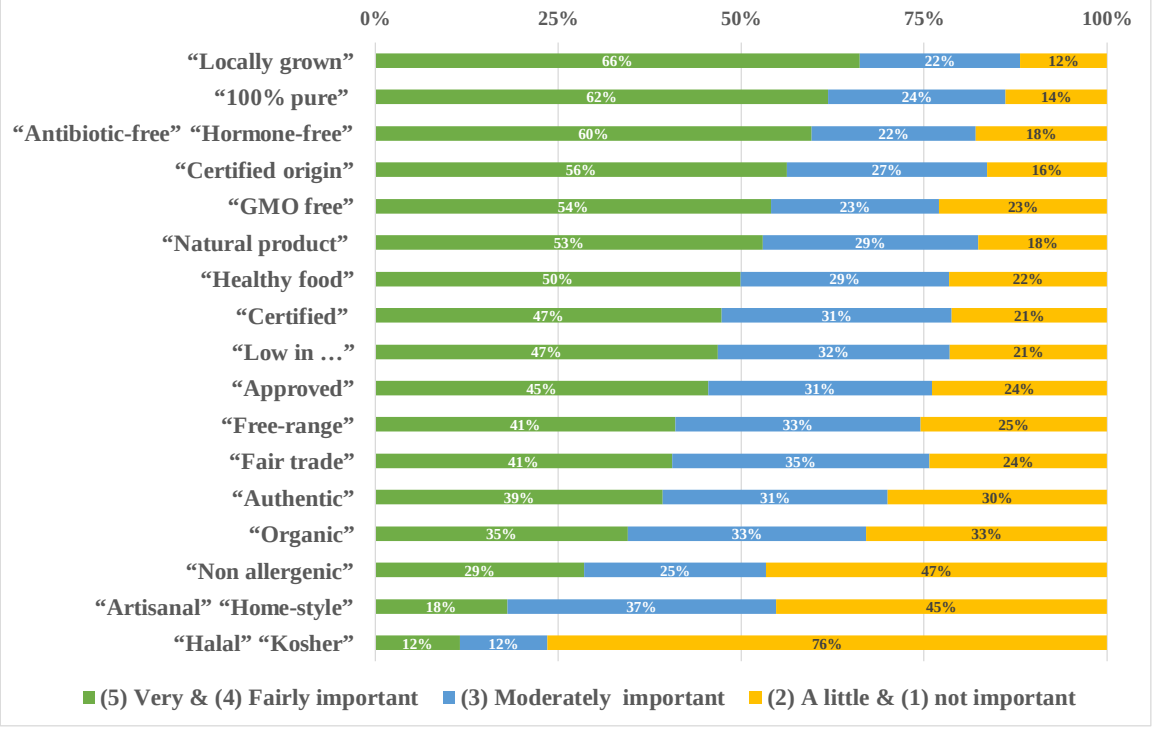
These claims fall mainly in the following categories:

1- Dietary value (non allergenic), 2- Religious value (Kosher, Halal), 3- Life style value (GMO free, organic, fair trade, free range), 4- Traditional production value (Natural product, artisanal, home-style), 5- Sourcing value (certified origin, locally grown, 100% pure, authentic), 6- Chemical free (antibiotic free, hormone free) and 7- Health claims (healthy food, low in…).

Claims referring to sourcing value and chemical free are among the most important for the consumers.

Figure 7 presents the importance given to each claim by the respondents and shows that claims referring to sourcing value and chemical free are among the most important for the consumers. Consistently with the previous results, the claim "locally grown" is perceived as the most important, with 2 in 3 of the respondents (66%) considering this claim fairly to very important. As well, the issue of traceability re-emerges here, with the claim "Certified origin" among the top 5. The second most important claim is "100% pure", which can be explained by a potential consumers' mistrust after recurrent fraud scandals regarding adulterated maple syrup, honey or olive oil in Quebec. The importance given to claims concerning the use of chemicals ("Antibiotic-free" and "Hormone-free") or genetically modified ("GMO-free") products is notable here, as they are also among the top 5.

Figure 7. How much importance do you attach to the following different types of claims:



Still consistent with previous results, "Organic" claims seem to be less important, with only 1 respondents in 3 perceiving this claim as fairly to very important. Locally grown food products seem therefore to be more valued than organic products. These results are congruent with other studies, focusing on Ontario for example, that have shown that consumers tend to favor local products in comparison to organic products, mainly because of economy – in the sense that it will develop the local economy – and environmental motivations (see Dodds *et al.*, 2014). These results might, however, be nuanced by the fact that consumers are sometimes confused about what "local" and "organic" actually mean and what these terms imply, especially regarding local products (Campbell *et al.*, 2014). The perceived ambiguity between the terms might lead consumers to mix attributes and thus favor, wrongly, one over the other.

66% of Quebeckers consider the claim "Locally grown" as fairly to very important.

However, even if the proportion of respondents giving the highest importance to the claim "Organic" is significantly lower than those perceiving the same way the claim "Locally grown", it still represents a significant proportion of the sample (35%), especially considering the market shares of organic products. Indeed, organic products represent only about 5% of the total food market in Canada (Arbulu & Zimmerman, 2017). This illustrates therefore the potential for continued growth in market share for organic products. Following the same logic, the potential for growth is even more important for Fair trade products, as their market share was only about 0.5 % of the total food market in Canada in 2015[26].

For 35 % of consumers organic certification is fairly to very important, while organic products represent only about 5% of the total food market in Canada. This illustrates the potential for continued growth in market share for organic products.

As with the previous results, some statistically significant variations are observable among respondents regarding the importance given to specific claims. Table 3 below regroups the most significant ones and presents the mean and standard deviation (SD) for each of them.

52% of respondents' over-54s are reassured by the local production of the product, against 41% of those under 54 (p = 0.001)

73% of over-54s consider the "local product" claim to be very important compared to 62% of those under 54 (p = 0.002)

[26] Source Statista: https://www.statista.com/statistics/722816/retail-sales-organic-and-fairtrade-canada/, visited February 2018.

Table 3. Selected significant variations for specific claims

Locally Grown

- Gender: more important for women than for men (W :3.87 (1.1) – M :3.66 (1.1), p=0.002);
- Age: more important for older individuals than for younger ones (18-44 years old: 3.6 (1.2), 45-75 years old and more: 3.9 (0.9), r_s =.11, p=0.0003);
- Language: more important for native French speakers than for native English speakers or for allophones (Fr: 3.85(1.0) vs Eng: 3.58 (1.1) p=0.004 & vs Allo: 3.44 (1.2), p=0.001).

Certified origin

- Age: more important for older respondents (18-44 years old: 3.34 (1.2), 45-75 years old and more: 3.62 (1.1), r_s =.14, p=0.0000).

GMO free

- Gender: more important for women than for men (W :3.54 (1.3) – M :3.26 (1.3), p=0.0007);
- Age: more important for older individuals than for younger ones (18-44 years old: 3.24 (1.4), 45-75 years old and more: 3.6 (1.3), r_s =.09, p=0.0061);
- Language: more important for native French speakers or for allophones than for native English speakers (Fr: 3.46 (1.3) & Allo: 3.70 (1.2), vs Eng: 3.08 (1.4), p=0.0000).

Organic

- Gender: more important for women than for men (W :3.10 (1.2) – M :2.88 (1.2), p=0.0051);
- Occupation: more important for students than other respondents (Students: 3.42(1.3) vs Others: 2.95 (1.2), p = 0.0002);
- Age: No monotonic relation according to age was observable, however, the youngest respondents give more importance to this claim than the others (18-24 years old: 3.34 (1.3) vs Others: 2.94 (1.2), p=0.0005). This result is actually strongly correlated to the previous one, as more than 79% of the students are between 18 and 24 years old;
- Language: more important for Allophones than for native French speakers or for native English speakers (Allo: 3.45(1.3) vs Fr: 2.98 (1.2) p=0.001 & vs Eng: 2.81 (1.3), p=0.0000).
- Level of education: Contrary to what has been observed for the reassuring aspect of specific elements, there is no variation according to the level of education for the importance attributed to the claim "organic".

Fair Trade

- Gender: more important for women than for men (W : 3.33 (1.1) – M :3.00 (1.2), p=0.0000);
- Occupation: more important for students than other respondents (Students: 3.55 (1.2) vs Others: 3.13 (1.2), p = 0.0005);
- Age: No monotonic relation according to age was observable, however, the youngest respondents give more importance to this claim than the others (18-24 years old: 3.43 (1.2) vs Others: 3.13 (1.2), p=0.006). As before, this result is correlated to the previous one.

Finally, one may wonder if respondents reassured by specific elements, such as those presented in Figure 5, consider the corresponding claim as important. Hypothetically, individuals who are the most reassured by a specific attribute should indeed give more importance to the corresponding claim. This is verified for several specific elements and their corresponding claims, as presented in Table 4.

Table 4. Correlation coefficients between reassuring elements and claims, and level of significance[27]

	Locally made products	Organic	Product's origin
Claims:			
1- "Locally grown"	**.38*** **	.08*	.07*
2- "Certified origin"	**.13*** **	.08*	**.12*** **
3- "Organic"	.09**	**.39*** **	.000

*Notes: n.s. if p > 0.05, * p<0.05, ** p<0.01, *** p<0.001*

Individuals reassured by locally made food products give moderately and significantly more importance to the claim "Locally grown", and, although less strongly, to the claim "Certified origin" which make sense as they surely want the local characteristic to be certified. A similar observation can be made with individuals reassured by the organic attribute of a product. The relation between this attribute and the corresponding claim is the strongest. This is understandable since the only way to know that a product is organic is through this claim directly on the product. Finally, respondents reassured by the specific origin of a product also gives slightly but significantly more importance to the claim "certified origin", most probably for traceability reasons. They do not, however, give significantly more importance to the claim "Locally grown". This is understandable since the origin of a product, which gives its singularity or is the guarantee of its quality, is not necessarily "local" (e.g. olive oil from Italy or Tunisia, wine from France, etc.).

As this study focuses on certification value, let's now have a similar analyze specifically for the presence of official seals, such as certifications. Table 5 below presents the

[27] The value of the coefficient illustrates the strength of the correlation (.1 < coef <.3: small correlation, .3 < coef < .5: moderate and coef > .5 strong correlation).

correlation between the presence of seals as a reassuring element and the importance given to the analyzed claims.

Table 5. Correlation coefficients between the presence of seals as a reassuring element and the importance given to specific claims

	Presence of official seals
1- "Locally grown"	-.04
2- "100% pure"	.09**
3- "Antibiotic-free" "Hormone-free"	.08*
4- "Certified origin"	**.14*** **
5- "GMO free"	.06
6- "Natural product"	.07*
7- "Healthy food"	.10**
8- "Certified"	**.24*** **
9- "Low in …"	.08**
10- "Approved"	**.22*** **
11- "Free-range"	.05
12- "Fair trade"	.02
13- "Authentic"	.10**
14- "Organic"	.03
15- "Non allergenic"	.08*
16- "Artisanal" "Home-style"	-.02
17- "Halal" "Kosher"	.00

*Notes: n.s. if p > 0.05, * p<0.05, ** p<0.01, *** p<0.001*

One can observe, if looking at the strongest correlation, that respondents reassured by official seals indeed tend to give moderately but significantly more importance to the claims "certified", "certified origin" and "approved". This highlight again the importance of direct information. Individuals reassured by official seals are looking for an explicit statement that an attribute is indeed certified or approved.

Respondents reassured by official seals tend to give moderately but significantly more importance to the claims "certified", "certified origin" and "approved".

4.2. Certifications and official seals

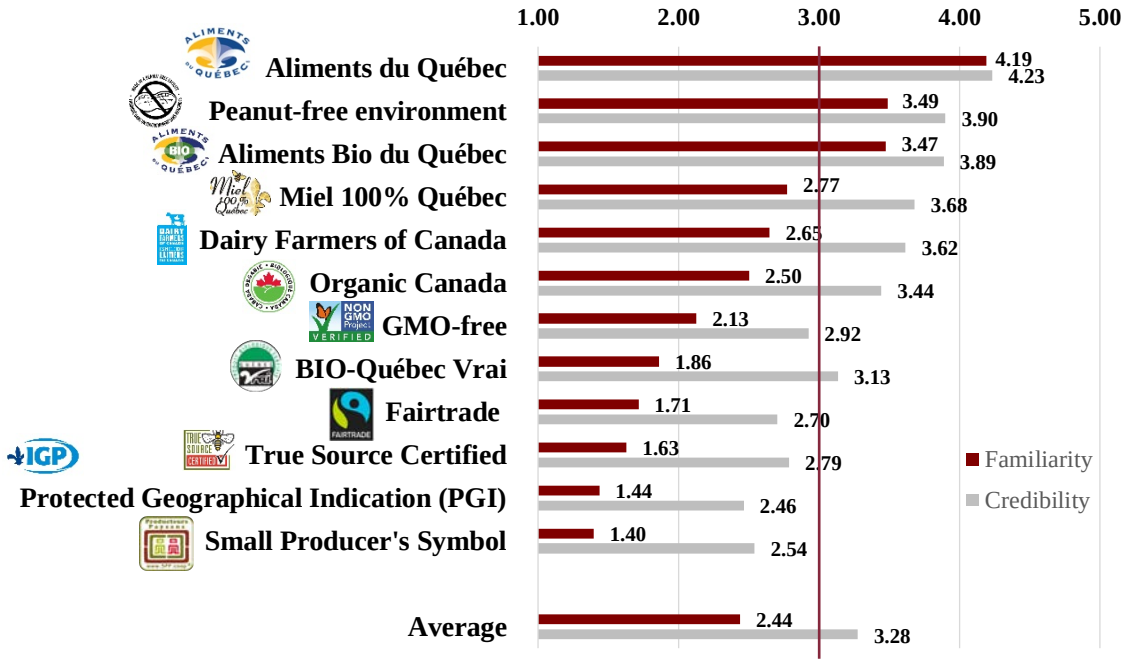
After investigating what consumers rely on to assess the quality of food products, and what type of claims they value the most, the familiarity with and perceived credibility of logos and official seals will be analyzed in this section, since the importance of official seals as a sign of quality has been suggested above.

78% of Quebeckers consider the logo "Aliments du Québec" as fairly to very familiar and 80% perceived it as fairly to very credible.

4.2.1. Familiarity with and perceived credibility of logos and certifications seals

Figure 8 presents the respondents degree of familiarity (from 1 – Not familiar to 5 – Very familiar, dark-red bars) as well as the perceived credibility (from 1 – Not credible to 5 – Very credible, grey bars) of selected logos and official seals. The average value for both familiarity and credibility are also presented at the bottom of Figure 8.

Figure 8. The respondents' familiarity with and perceived credibility of certification seals (from 1 – Not familiar/credible to 5 – Very familiar/credible)



The prevalence of the local origin of the product is clear here also, with the logo "Aliments du Québec" being the most familiar and perceived as the most credible official seal. The

organic version, “Aliments bio du Québec” is also among the most familiar and perceived as the most credible. This is most probably because of its close connection with the original seals rather than its organic dimension, considering on the first hand the previously analyzed results regarding organic products and claims, and the level of familiarity and credibility given to organic logos presented in Figure 8 on the other hand (the first organic logo, “ Organic Canada” being in the sixth position).

Surprisingly, while the claim “Non-allergenic” was amidst the least important ones (see Figure 7), the logo “Peanut-free environment” is the second most familiar and most credible for the respondents. The lesser importance given to the claim “Non-allergenic” might be explained by the relatively low proportion of respondents forced to adapt their diet for food allergies reasons (18.3%). However, general public is also highly, but indirectly affected by food allergies, especially in school environments (Brown *et al.*, 2015). This might explain the high familiarity with the logo “Peanut-free environment”. Familiarity with this logo is indeed higher for individuals directly affected by food allergies (3.9 (1.4) vs 3.4 (1.5), $p = 0.0000$) but also for food respondents with children, regardless of the age of the children (3.9 (1.3) vs 3.4 (1.5), $p = 0.0000$), even if they are not directly affected by food allergies (3.9 (1.3) vs 3.3 (1.5), $p = 0.0000$).

The three certifications with which respondents are the least familiar with are “True Source Certified”, “PGI” and “Small Producers’ Symbol”. This can be mainly explained by the still relatively low proportion of products bearing these seals. No beekeepers nor packers from Quebec are currently certified “True Source Certified” and only one organization in the province is presently importing certified honeys[28]. As well, only very specific products are eligible to the “IGP” certifications, and the “Small Producer’s Symbol”, while in growing emergence, remains much less developed than Fairtrade (Clark & Hussey, 2016).

It is also interesting to investigate if the familiarity with a specific seal is influenced by the importance given to the corresponding claim. Said differently, are individuals familiar with the logos because they are specifically looking for them in response to the importance they give to certain allegations? In an attempt to answer this question, Table 6 presents the

[28] See https://tshmember.com/member.html, consulted February, 2018.

correlation coefficient between the importance given to specific claims and the familiarity with official seals.

Table 6. Spearman's coefficient between the importance given to specific claims and the familiarity with official seals

	Familiarity with											
Importance of												
"Locally Grown"	.31***	.09**	.25***	.23***	.12***	.21***	.13***	.15***	.11***	.06*	.04	.04
"Organic"	.10**	.05	.17***	.08*	.02	.30***	.35***	.24***	.25***	.11***	.14***	.14***
"GMO free"	.19***	.09**	.21***	.11***	.00	.25***	.25***	.16***	.13***	.06*	.04	.04
"Fair trade"	.15***	.11***	.18***	.11***	.10**	.24***	.24***	.16***	.24***	.11***	.07*	.07*
"Non Allergenic"	.03	.12***	.10**	.14***	.14***	.18***	.07*	.17***	.04	.15***	.13***	.13***

*Notes: n.s. if p > 0.05, * p<0.05, ** p<0.01, *** p<0.001*

As one can observe, the familiarity with every seal is significantly correlated with more than one claim. For almost every seal, the familiarity is significantly correlated with at least three different types of claims. For instance, if the familiarity with the logo "Aliment du Québec" is indeed moderately and significantly correlated with the importance given to the claim "locally grown", such correlation making a practical sense, it is also lightly correlated with "GMO free" and "Fairtrade". As well, the familiarity with the logo "Canada Organic" is indeed moderately correlated with the importance given to the claim "Organic", as expected, it is also correlated with "GMO free" and "Fairtrade". Surprisingly, the correlation between the familiarity with the logo "NON GMO Project verified" and "Organic" is stronger than with "GMO free". These results are really not straightforward to analyze. One plausible explanation for the multiple correlations is that if indeed individuals look for specific logos in reaction to the importance given to a specific claim, they might encounter other logos, with which they also become more familiar. This, however, does not explain why the familiarity with the logo "NON GMO Project verified" and "Organic" is stronger than with "GMO free", for example. This need further investigation.

Let's now have a global analysis based on the average value for familiarity and credibility. In average, the level of familiarity is slightly higher for women than for men (W : 2.55 (0.7), M : 2.38 (0.7), p = 0.0000), which can be explained by the fact that women are still more involved in grocery shopping than men. Indeed, in our sample, 86% of female respondents make grocery shopping most of the time by themselves against 71% for male respondents (p = 0.0000). This observation is also valid for the average credibility, which was expected, given the existing correlation between familiarity and credibility, as presented in Table 8 below.

86% of female respondents make grocery shopping most of the time by themselves against 71% for male respondents (p = 0.0000).

Interestingly, the average value of familiarity also varies significantly with the age of the respondent (r_s = -.18, p = 0.0000), the older the respondent, the lesser the familiarity. Again, the same logic applies with the average credibility (r_s = -.17, p = 0.0000). However, this variation according to the age cannot be explained by the respondents' habits of doing their grocery shopping most of the time by themselves, as older respondents tend to be more involved in grocery shopping than the younger ones (r_s = .12, p = 0.0001). This variation is particularly significant for specific logos, as presented in Table 7, such as Peanut-free environment, GMO free and FairTrade.

The older the respondent, the lesser the familiarity with the logos or the official seals.

Table 7. Spearman correlation coefficients between the familiarity with logos or official seals and the age of the respondents

Logos or official seals	Corr. Coef.	
Aliments du Québec	-.05	
Peanut-free environment	**-.24**	*******
Aliments Bio du Québec	-.11	***
Miel 100% Québec	.06	*
Dairy Farmers of Canada	-.16	***
Organic Canada	-.04	
GMO-free	**-.26**	*******
BIO-Québec Vrai	.02	
Fairtrade	**-.21**	*******
True Source Certified	-.10	**
Protected Geographical Indication (PGI)	-.14	***
Producers Farmers	.00	
Average	**-.18**	*******

*Notes: n.s. if p > 0.05, * p<0.05, ** p<0.01, *** p<0.001*

This does not seem to be related to the importance given to specific claims, as if younger individuals tend, indeed, to give slightly more importance to the claim "Fair Trade", it is the opposite for "GMO free" (there was no variation for " Non allergenic"). This need further investigation.

4.2.2. Relation between familiarity and perceived credibility

Table 8 presents the numerical means, standard deviations and correlation coefficients between the familiarity with and the perceived credibility of certification seals. In agreement with existing literature (e.g. M. Janssen & Hamm, 2011; Park & Millar, 2016; Sirieix *et al.*, 2013), there is a positive and statistically significant relationship between familiarity and credibility. This was expected since familiarity evokes trust in the label and in the product (Tonkin *et al.*, 2015), and trust is a strong determinant of labels credibility (Moussa & Touzani, 2008).

Table 8. Mean, standard deviation and correlation coefficient between familiarity with and perceived credibility of certification seals

Logos or official seals	Familiarity		Credibility		Corr. Coef.	
Aliments du Québec	4.19	(1.13)	4.23	(0.93)	0.64	***
Peanut-free environment	3.49	(1.46)	3.90	(1.13)	0.67	***
Aliments Bio du Québec	3.47	(1.36)	3.89	(1.06)	0.58	***
Miel 100% Québec	2.77	(1.37)	3.68	(1.04)	0.51	***
Dairy Farmers of Canada	2.65	(1.36)	3.62	(1.11)	0.53	***
Organic Canada	2.50	(1.29)	3.44	(1.03)	0.50	***
GMO-free	2.13	(1.40)	2.92	(1.22)	0.58	***
BIO-Québec Vrai	1.86	(1.05)	3.13	(1.04)	0.40	***
Fairtrade	1.71	(1.13)	2.70	(1.15)	0.54	***
True Source Certified	1.63	(0.94)	2.79	(1.11)	0.36	***
Protected Geographical Indication (PGI)	1.44	(0.82)	2.46	(1.09)	0.38	***
Producers Farmers	1.40	(0. 81)	2.54	(1. 12)	0.34	***
Average	**2.47**	**(0.70)**	**3.30**	**(0.7)**	**0.52**	*******

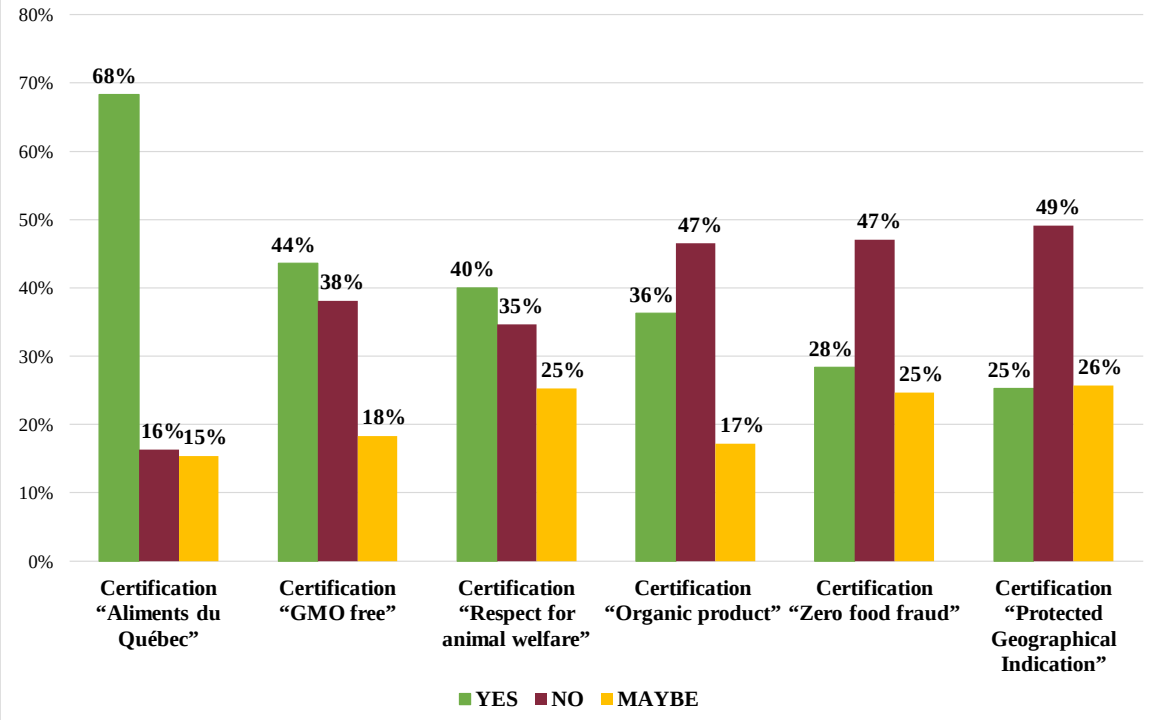
*Note: *** p<0.001*

However, one can observe both in Figure 8 and Table 8 that the credibility of certification seals does not decrease at the same rate as the associated level of familiarity. Respondents still perceive a relatively moderate credibility for the seals they are the less familiar with, such as “True source certified”, “PGI” or “Producers Farmers” for example. This is illustrated by the significant positive relationship between the correlation coefficient and the familiarity: the lesser the familiarity, the lesser the correlation between familiarity and credibility (r_s: 0.52, p = 0.0007). This means that respondents are able to give credit to logos or certification seals despite their lack of familiarity with them, based on the mere existence of such seals (Parkinson, 1975), or the perceived credibility and nature of the sponsoring organization (Beltramini & Stafford, 1993; Moussa & Touzani, 2008). These results, however, ask the question of their level of knowledge regarding the mechanism of certification behind these seals. This issue will be investigated further in a subsequent section of this report.

4.3. Changes in purchasing behaviour and willingness to pay for specific certifications

Respondents were asked if existing or fictitious certifications have changed or would change their purchasing behaviour (CB) and their willingness to pay (WTP) for products presenting such certification. These results are presented by Figure 9 and Figure 10 respectively.

Figure 9. Change in purchasing behaviour (CB)



The higher proportion of respondents which would change or already have changed their purchasing behaviour (68%) and are willing to pay more (48%) concerns the certification "Aliments du Québec". Such result was expected considering previous ones.

However, the interest for this certification of origin should not overshadow the potential for development of a niche market regarding other certifications, as already discussed above. A significant proportion of the respondents have already changed or would change their behaviour and are willing to pay more for "GMO-free" (CB 44%, WTP 27%), "Organic" (CB 36%, WTP 27%) and "Respect animal welfare" (CB 40%, WTP 27%) certified products.

Moreover, the change of purchasing behaviour regarding specific certifications appears to be strongly or moderately correlated with the importance given to the corresponding claim (e.g. "GMO-free" $r_s = .62$, $p = 0.0000$, "Organic" $r_s = .54$, $p = 0.0000$ and "Locally grown" $r_s = .38$, $p = 0.0000$), which illustrates consistency between self-reported behaviour and personal values.

Figure 10. Willingness to pay (WTP)

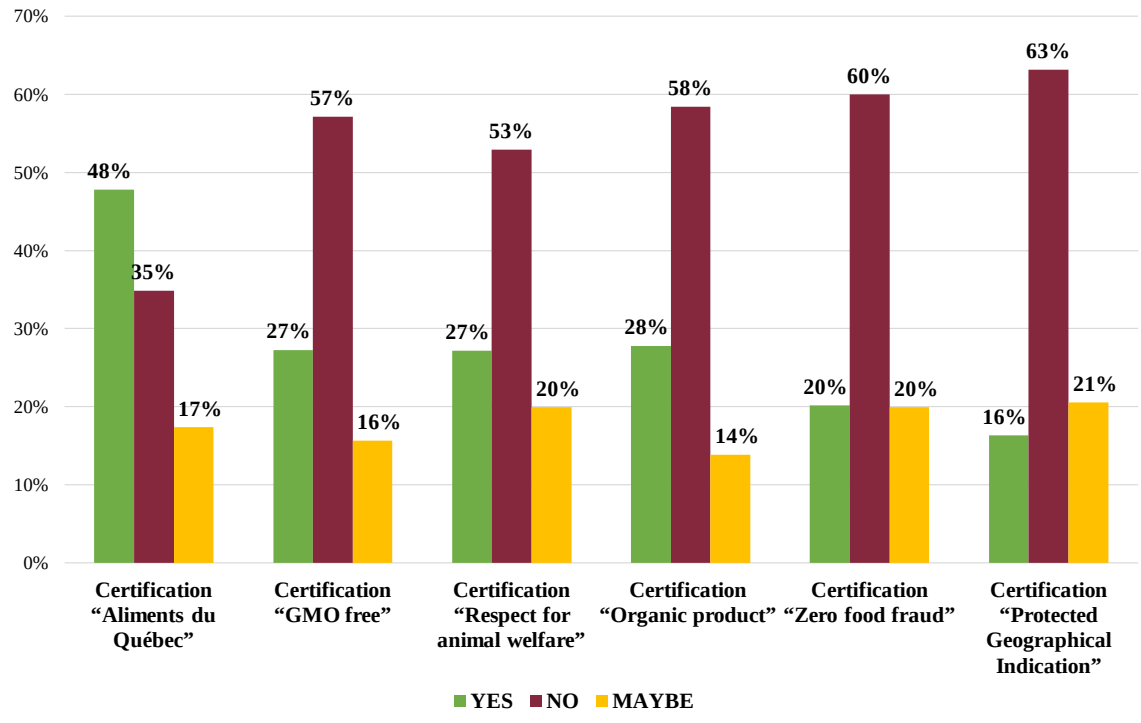


Figure 10 illustrates the willingness to pay (WTP) for the certifications. WTP is strongly correlated with the change of behaviour, actual or anticipated (r_s = .57, p = 0.0000). Said differently, the higher the intention for an individual to change his or her purchasing behaviour for a specific certification, say "GMO free", the higher the willingness to pay for it.

The WTP is relatively weak except for the certification "Aliments du Québec"

These results are coherent with previous studies. For example, Loureiro and Hine (2002), in a U.S. context, have found that consumers have a higher WTP for local products than organic and GMO-free ones. However, according to their study, the WTP for organic attributes carries a significantly higher WTP that the GMO-free attribute, which is not the case here.

In a relatively more recent study, Bernard *et al.* (2006), also in a U.S. context, have found that consumers are willing to pay more for GMO-free products than for their organic counterpart. Said differently, consumers who are willing to pay for the GMO-free attribute of a given product, is not interested at paying for the remaining attributes given by the organic certification, which according to the authors, illustrate the potential for development of GMO-free certifications. This interpretation is consistent with our results. However, McCluskey and Loureiro (2003), in their meta-analysis of consumer preferences and WTP for food labelling studies, have argued on the importance of cultural influence in the consumers' choices. The generalisation of our results is therefore limited.

Finally, there is no consensus in the literature regarding the influence of household income on WTP (e.g. Batte *et al.*, 2007; Bernard *et al.*, 2006; McCluskey & Loureiro, 2003). According to our results, the WTP is not affected by household income, neither in average (r_s = -.04, p = 0.25) nor for certifications taken independently.

However, the level of education has a significant, although weak, influence for some specific certification,

Do certain socio-demographic characteristics influence the WTP?

The willingness to pay is not affected by household income, neither in average nor for certifications taken independently.

Individuals with higher levels of education are slightly more willing to pay for organic certifications, independently of the level of family income.

especially for the organic attribute, as presented in Table 9. This means that individuals with higher levels of education are slightly more willing to pay for organic certifications, independently of the level of family income, thus eliminating financial considerations.

Table 9. Spearman correlation coefficients between WTP and level of education

Logos or official seals	Corr. Coef.
Aliments du Québec	.07 *
GMO-free	.10 **
Respect of animal welfare	.06
Organic	**.15 *** **
Zero food fraud	.03
PGI	.07 *
Average	**.11 *** **

*Notes: n.s. if p > 0.05, * p<0.05, ** p<0.01, *** p<0.001*

4.3.1. Influence of personal values on consumers' behaviours

Consumer's attitudes and behaviours regarding food choice are complex phenomena, influences by many interacting variables (Conner & Armitage, 2006; Rogers & Blundell, 1990; Sobal *et al.*, 2006) and context dependant (Saba, 2001). In particular, personal values are well acknowledged to affect such attitudes and behaviours (Hauser *et al.*, 2013). Therefore respondents were asked to rate how important is the role of specific values in their eating habits. Table 10 below presents the correlation between these values and their behavioural intentions regarding the certifications analysed in this section.

In order to alleviate this section and considering that they are strongly correlated, a focus is made on the change of purchasing behaviour change (CB) rather than the willingness to pay (WTP).

Table 10. Correlation coefficient between specific personal values and change of behaviour (CB) for different certifications

	"Aliment du Québec"	"GMO free"	"Respect of animal welfare"	"Organic"	"Zero food fraud"
1- Healthy weight	.11***	.16***	.16***	.18***	.13***
2- Cost of grocery	.05	.05	.08**	-.01	.09**
3- Food safety	.28***	.20***	.16***	.01**	.14***
4- Health in general	.20***	.21***	.19***	.17***	.17***
5- Animal welfare	.18***	.26***	**.46*** **	**.22*** **	.26***
6- Authenticity of food	.26***	**.29*** **	.25***	.20***	**.27*** **
7- The environment	.26***	**.29*** **	**.35*** **	**.26*** **	.26***
8- Working conditions of producers	.23***	.24***	**.34*** **	.17***	**.28*** **
9- Origin of the products	**.31*** **	.25***	.24***	.21***	.24***
10- Local economy	**.39*** **	.21***	.25***	.16***	.21***
11- Production methods	.27***	.25***	**.33*** **	.20***	**.31*** **
12- Food waste	.25***	.17***	.27***	.15***	.25***
13- Food overpackaging	.26***	.21***	.27***	**.22*** **	.26***

*Notes: n.s. if p > 0.05, * p<0.05, ** p<0.01, *** p<0.001*

Interestingly, the cost of groceries does not seem to influence the behavioural intentions of the respondents regarding any of the analysed certifications. Moreover, if their behaviour seems to be significantly affected by the importance given to all the other values, some of them appear to be a stronger driving force.

The cost of groceries does not seem to influence the behavioral intentions of the respondents regarding any of the analysed certifications.

Thus, respondents for which the certification "Aliments du Québec" would change or have changed their purchasing behaviour tend to give more importance to both the origin of the product and the local economy in their eating habits. Similarly, respondents willing to change their behaviour for "GMO free" certifications seem to be more driven by the authenticity of the food as well as the environment. As well, individuals interested in "organic" certifications appear to be influenced by the environment but also animal welfare

and food overpacking. These results are coherent with those of previous study (Honkanen *et al.*, 2006).

In order to deepen the analysis of their influence on behavioural intentions regarding food choices, the values have been regrouped in two different factors using a principal component analysis (PCA) coupled with a varimax rotation and a scree test (Cattell, 1996). These two factors – Self-oriented values and Other- & environment-oriented values – are presented in Table 11 below. All the values show a satisfactory loading (above 0.4) (Beavers *et al.*, 2013) in their respective factor. Moreover, the two factors show a satisfying internal consistency with a Cronbach's alpha (α) value of 0.70 or above (Hair *et al.*, 1998).

Table 11. Composition of the Value factors

	Factor loadings	**Variance explained (%)**	**Alpha if item deleted**
Self-oriented Values (α= 0.70)		18%	
Healthy weight	.73		.64
Price	.65		.69
Food safety	.60		.58
Health in general	.71		.53
Other- and environment-oriented Values (α= 0.92)		42%	
Animal welfare	.62		.92
Authenticity of food	.70		.91
The environment	.79		.91
Working conditions of producers	.83		.91
Origin of the products	.79		.91
Local economy	.80		.91
Production methods	.83		.91
Food waste	.67		.91
Food overpack	.69		.91

Table 12 therefore shows the correlation coefficients between the two value factors and behavioural intentions for specific certifications. The intention that the individuals have to change their purchasing behaviour toward specific certification appears to be more strongly influenced by other- and environment-oriented values than self-oriented values. This result has important implications in the understanding of consumers' attitudes and behaviour regarding certifications.

The intention that the individuals have to change their purchasing behavior toward specific certification appears to be more strongly influenced by other- and environment-oriented values than self-oriented values.

Table 12. Correlation coefficients between the Values factors and change of behaviour (CB) for different certifications

	Self-oriented Values	*Other- and Env-oriented Values*
1- "Aliment du Québec"	.21***	.34***
2- "GMO free"	.20***	.31***
3- "Respect of animal welfare"	.20***	.40***
4- "Organic"	.15***	.26***
5- "Zero food fraud"	.19***	.33***

*Notes: n.s. if p > 0.05, * p<0.05, ** p<0.01, *** p<0.001*

4.3.2. Influence of perceived risks on consumers' behaviours

It is also well established that risk perceptions influence consumers' behavioural intentions (Choi *et al.*, 2013; Yeung *et al.*, 2010). Respondents have thus been asked to rate the perceived level of risk (from 1- Negligible to 5- Very high) to their health and that of their relatives for different possible hazards. Table 13 presents the average perceived level of risk and standard deviation for each evaluated hazard.

Table 13. Average values of perceived risks to the health of different possible hazards

Hazard	Mean (SD)
1- The consumption of Genetically modified organisms (GMO)	3.73 (1.8)
2- The use of antibiotics in livestock	4.05 (1.5)
3- The use of pesticides on crops	4.26 (1.4)
4- The consumption of imported food	3.42 (1.7)
5- The unsanitary conditions in production, processing, distribution and retail facilities	4.52 (1.3)

In average, unsanitary conditions in production, processing, distribution and retail facilities represents the highest level of perceived risk by the respondents. Conversely, the consumption of imported food seems to represent the lowest level of perceived risk. These levels of perceived risk are influenced by several demographic variables, as presented in Table 14 below.

Table 14. Correlation coefficients between the level of perceived risk to the health of different possible hazards and demographic variables

Hazard	Gender (M(1)- W(2))	Age	Education
1- GMO	**.50*** **	.02	-.09**
2- Antibiotics	**.48*** **	.05	-.03
3- Pesticides	.30***	**.19*** **	-.05
4- Imported food	.11	**.23*** **	**-.15*** **
5- Unsanitary conditions	.26***	.15***	-.06*

*Notes: n.s. if p > 0.05, * p<0.05, ** p<0.01, *** p<0.001*

In general, women tend to perceive higher level of risk than men, except for imported food, where there are no significant differences. For example, 44% of women estimate that the consumption of GMO represents a high or very high level of risk to their health and that of their relatives against 33% of men. Similarly, 65% of women judge that the use of antibiotics is potentially harmful against 51% of men. Also, older

The perceived level of risk of different hazard is influenced by gender, age, and level of education.

respondents perceive a higher level of risk for the use of pesticide and for imported food than younger ones. Finally, the level of education does not seem to have a strong and significant influence except for the consumption of imported food. For this risk, the higher the level of education of the respondent, the lower the perceived level of risk.

To analyse now the influence of perceived risk on consumers behaviour, Table 15 presents the correlation between specific perceived risks and change of behaviour (CB) for different certifications. One can observe that the strongest correlation is between the perceived risk of GMO consumption and purchasing intentions for GMO-free food. This is indeed a hot topic, and this result is not surprising considering the technological nature of this risk (Kaptan *et al.*, 2017).

Table 15. Correlation coefficient between specific perceived risks and change of behaviour (CB) for different certifications

	GMO Consumption	Use of antibiotics in livestock	Use of pesticides on crops	Consumption of imported food
1- "Aliment du Québec"	.13***	.12***	**.19*** **	**.13*** **
2- "GMO free"	**.37*** **	**.25*** **	**.23*** **	**.14*** **
3- "Respect of animal welfare"	.11**	.12***	.13***	.05
4- "Organic"	**.17*** **	**.16*** **	**.19*** **	.09**
5- "Zero food fraud"	.04	.02	.04	.09**

*Notes: n.s. if p > 0.05, * p<0.05, ** p<0.01, *** p<0.001*

The purchasing intention toward organic certified products is also correlated, although less strongly, to the perceived risk of GMO consumption. This result is also unsurprising as organic food, in Canada, is also GMO free. What is surprising, however, is the difference of correlation strength, as considering the attribute of both certifications one could expect the correlation strength to be similar. As well, the perceived risks of the use of antibiotics seem to influence purchasing behaviour for both GMO-free food and organic food, but the former more strongly. The same observation can be made for the perceived risk of the use of pesticide, which seems to lightly also influence purchasing behaviour toward local products. **These results illustrate once again a possible lack of clear understanding of the specific attributes of each certification**.

As for the values, it is possible to regroup the different element of perceived risks in a unique factor. The characteristics of this factor are presented in Table 16.

Table 16. Composition of the Risks factor

	Factor loadings	Variance explained (%)	Alpha if item deleted
Risks (α= 0.83)		62%	
GMO Consumption	.77		.80
Use of antibiotics in livestock	.85		.75
Use of pesticides on crops	.87		.77
Consumption of imported food	.75		.82

Using this factor, it is the behavioural intentions of the respondents regarding "GMO free" certifications that appear to be the most influenced by the perceived risks, as presented in Table 17. This was expected considering results presented in Table 15.

Table 17. Correlation coefficient between perceived risks and change of behaviour (CB) for different certifications

	Risks
1- "Aliment du Québec"	.11***
2- "GMO free"	**.30*** **
3- "Respect of animal welfare"	.17***
4- "Organic"	.20***
5- "Zero food fraud"	.21***

*Notes: n.s. if p > 0.05, * p<0.05, ** p<0.01, *** p<0.001*

4.3.3. Influence of trust in the agri-food industry on consumers' behaviours

Finally, after values and perceived risks, trust in the agri-food system has been shown to influence consumers' confidence in food safety and therefore to affect their purchasing behaviour (de Jonge *et al.*, 2004; de Jonge *et al.*, 2008; Pivato *et al.*, 2007). Respondents of the survey were thus asked to indicate their level in confidence (from 1- Not confident to 5- Very confident) in several elements and actors of the agri-food chain. Results are presented in Table 18.

Table 18. Average values of confidence in elements and actors of the agri-food chain

Elements and actors	Mean (SD)
1- The quality of the food	3.58 (.76)
2- The brands of the food	3.65 (.77)
3- The labelling of the food	3.47 (.81)
The agri-food industry :	
4- Food producers	3.55 (.84)
5- Food processors	3.05 (.90)
6- Distributors/wholesalers	3.15 (.85)
7- Food retailers	3.28 (.85)
8- The institutions that oversee this industry	3.21 (.88)
9- The regulations that govern this industry	3.31 (.91)
10- The enforcement of those regulations	3.05 (.98)

In average, one can see that the level of confidence in the agri-food system in general, as presented here is medium for the respondents. Interestingly, respondents seems to have more confidence in the general characteristic of the food product (its quality, the labelling, the brands), than in the agri-food actors, except for food producers.

The level of confidence is not significantly influenced by demographic variables

These levels of confidence do not seem to vary according to demographic variables, except for the quality and brands of food, in which older respondents have more confidence in than younger ones (r_s = .13, p = 0.000 and r_s = .14, p = 0.000 respectively). For example, 65% of respondents of 35 and older are fairly to very confident in the food quality against 46% of

younger respondents. Similarly, 68% of respondents of 35 and older are fairly to very confident in the brands of food against 50% of younger respondents.

To analyse the influence of level of trust on consumers behaviour, Table 19 displays the correlation coefficients between trust in the agri-food system and change of behaviour (CB) for different certifications.

Table 19. Correlation coefficient between trust in the agri-food system and change of behaviour (CB) for different certifications

		"Aliment du Québec"	"GMO free"	"Respect of animal welfare"	"Organic"	"Zero food fraud"
1-	The quality of the food	.14***	.00	.03	.01	.03
2-	The brands of the food	.16***	-.01	.03	-.01	.00
3-	The labelling of the food	.08*	.07*	.06	-.03	.07*
The agri-food industry :						
4-	Food producers	**.23*** **	.04	.07*	.03	.04
5-	Food processors	.01	-.05	-.02	-.05	.02
6-	Distributors/wholesalers	.03	-.06*	-.02	-.05	.00
7-	Food retailers	.08**	.00	.03	.00	.00
8-	The institutions that oversee this industry	.05	.00	.00	.00	.01
9-	The regulations that govern this industry	.08**	-.01	.00	-.01	.02
10-	The enforcement of those regulations	.03	.00	.00	-.01	.03

*Notes: n.s. if p > 0.05, * p<0.05, ** p<0.01, *** p<0.001*

Remarkably enough, only the change of purchasing behaviour regarding the certification "Aliments du Québec" is correlated with trust in some elements and actors of the agri-food system. More precisely, individuals in this study that would change or have already changed their purchasing behaviour for the certification "Aliment du Québec" would tend

Only the change of purchasing behavior regarding the certification "Aliments du Québec" is correlated with trust in some elements and actors of the agri-food system, especially in food producers.

to have a higher level of trust in the quality and the brand of the food, but more importantly in food producers. Trust does not seem to have an influence on purchasing behaviour for the other certifications.

4.4.Summarizing model

Finally, in an attempt to summarize the influence of the variables that have been analyzed so far as well as to better understand and predict intentions of behaviour and willingness to pay regarding specific certifications (Aliments du Québec, GMO free and Organic), a logit model has been constructed. Demographic variables (gender, age, level of education and income), the reassuring elements, the familiarity with and the perceived credibility of the certification as well as the three previous predicators (personal values, perceived risks and trust) have been integrated in this model. Considering the important number of variables, Table 20 below displays only those for which statistically significant results have been found for at least one certification (except the four demographic variables that are systematically reported).

For the three certifications analysed ("Aliments du Québec", "GMO free" and "Organic"), the likelihood ratio chi-square (χ^2) of, respectively, 472.76, 373.85 and 396.24, is statistically significant, with a p-value < 0.0001. This indicates that the model used to analysed the change of purchasing behaviour, from NO to YES, is statistically better than a model without any independent variables, called here predicators.

The coefficients for each predicator are presented in Table 20 for the three analyzed certifications. When in bold, it indicates that the coefficient is statistically significant and, indeed, has an influence in the explanation of the purchasing behaviour toward the correspondent certification. For example, for "Aliments du Québec", if an individual were to increase her or his perceived credibility of the certification by one unit, the log-odds of changing her or his purchasing behaviour would be expected to increase by 0.53, holding all other variables constant. Conversely, the model tells us that if she or he were to increase her or his perceived risks of use of antibiotics in livestock, the log-odds of changing her or his purchasing behaviour would be expected to decrease by 0.26.

Table 20. Results of Multinomial logistic regression – Change of purchasing behaviour

	"Aliment du Québec"	"GMO free"	"Organic"
Variables	Yes VS No	Yes VS No	Yes VS No
1- Gender	.40 (.22)	.22 (.17)	-.13 (.17)
2- Age	.00 (.07)	.08 (.06)	**-.15** (.06)**
3- Income	.00 (.00)	.00 (.00)	.00 (.00)
4- Level of education	.00 (.01)	.01 (.00)	.01 (.01)
5- Familiarity with	**.28* (.11)**	**.28*** (.07)**	**.32*** (.08)**
6- Perceived credibility of	**.53*** (.13)**	**.31*** (.09)**	**.50*** (.10)**
Reassuring elements			
7- Locally made product	**.98*** (.26)**	.19 (.20)	**.49* (.20)**
8- Ingredients listed on packaging	**-.55* (.25)**	-.13 (.19)	-.02 (.20)
9- Brand	**-1.21*** (.28)**	**-.50* (.24)**	-.23 (.24)
10- Organic products	.21 (.38)	**.90*** (.31)**	**2.07*** (.37)**
11- Products sold from a trusted establishment	-.45 (.29)	**-.68** (.24)**	-.33 (.25)
12- Advice from friends and family	-.41 (.38)	-.35 (.35)	**-.75* (.38)**
Personal values			
13- Healthy weight	.14 (.12)	.14 (.09)	**.25** (.10)**
14- Food safety	**.38* (.17)**	**.40** (.15)**	-.08 (.15)
15- Local economy	**.76*** (.16)**	.00 (.12)	-.12 (.12)
16- Cost of food	-.16 (.13)	**-.22* (.10)**	**-.26** (.10)**
17- Origin of the products	.26 (.16)	**.36** (.13)**	**.45** (.13)**
18- Food overpackaging	.17 (.15)	.09 (.11)	**.27* (.12)**
Perceived risks			
19- Use of antibiotics	**-.26* (.11)**	.06 (.09)	-.06 (.09)
20- GMO Consumption	-.02 (.07)	**.27*** (.06)**	.08 (.06)
Trust			
21- The labelling of the food	-.28 (.20)	**.59*** (.15)**	.21 (.15)
22- Producers	**.66*** (.20)**	.03 (.15)	.03 (.15)
23- Distributors/wholesalers	**-.65* (.26)**	**-.48** (.18)**	-.13 (.18)
24- Food retailers	**.56* (.25)**	.26 (.17)	.09 (.17)
25- The regulations that govern this industry	**.48* (.21)**	-.30 (16)	-.22 (.16)
N	1032	1032	1032
χ^2	**472.76*** **	**373.85*** **	**396.24*** **
Pseudo R^2	.26	.17	.19

Notes: Standard errors in parentheses
*n.s. if p > 0.05, * p<0.05, ** p<0.01, *** p<0.001*

5

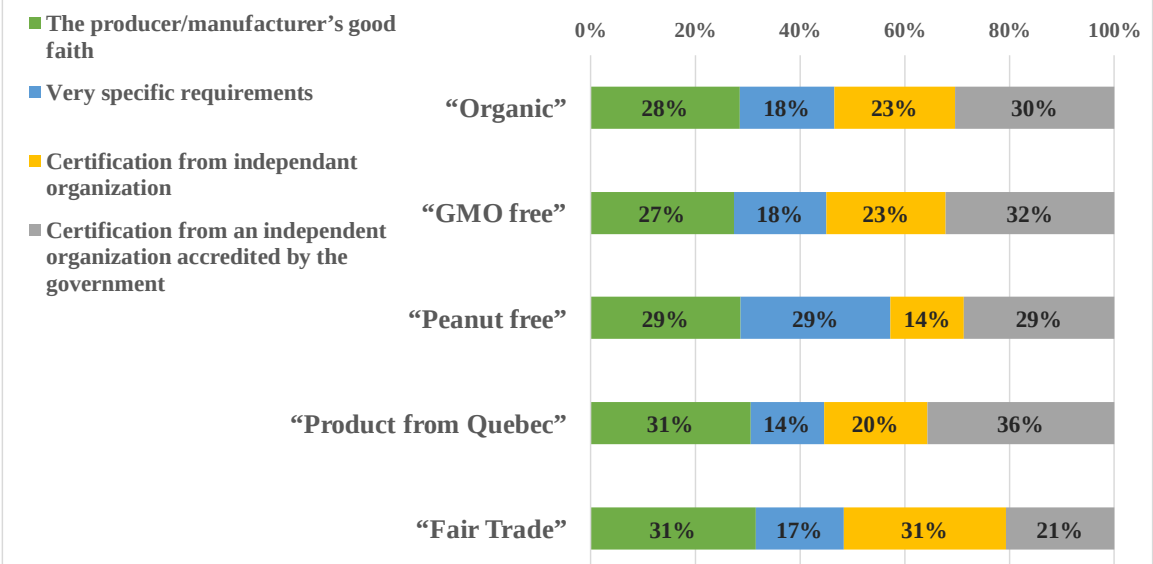
Certification process and development of certifications

As evoked in the previous section, several results analyzed so far have raised the issue of consumer knowledge of certification control mechanisms. This is peculiarly relevant since certifications, especially third-party certifications, imply an expensive process for producers and industries. One may therefore wonder what the benefit of such investment in regards to public perceptions is. Analysing the consumers' perceptions of control and certification process for specific certifications might therefore shed some light on this issue.

5.1. Certification control mechanisms

Hence, respondents were asked on what basis they believe selected claims are certified. Figure 11 presents the results. Respondents had the choice between four possibilities: 1- The producer/manufacturer's good faith (green bars), 2- Very specific requirements (blue bars), 3- Certification from independent organization (yellow bars)or 4- Certification from independent organization accredited by the government (grey bars).

Figure 11. Knowledge of certification control mechanisms



According to these results, respondents seem confused about the certification control mechanisms, as no clear opinion stands out for any type of claim. Indeed, more than a fourth of the respondent believe claims are either certified only based on the producer/manufacturer's good faith or by an independent organization accredited by the government. Among the proposed choice of claims, only Organic certifications require the intervention of an independent organization accredited by the government. GMO free and Fair Trade are also third-party certifications, but accreditation from a government-accredited organisation is not mandatory. The control mechanism for Peanut free certification is not straightforward, as different levels are possible. Allergen Control™ is the only third-party certification recognized by the government. Other certifications are certification marks or claims from manufacturers. Finally, Product from Quebec was a claim imposed by the provincial government, but the sole responsibility of the producers. This claim is no longer mandatory since 2016.

Respondents seem confused about the certification control mechanisms, as no clear opinion stands out for any type of claim

Unfortunately, this issue of lack of consumer knowledge about certification control mechanisms is not anew. Parkinson (1975), more than 40 years ago, already urges the need to educate consumers on the certification meaning for their own protection as it influences their decision-making on food products. Indeed, according to our results, there is a significant correlation between the perceived control mechanism of a claim and the perceived credibility granted to the corresponding logo. The more the control mechanism of a certification is perceived to be binding, the more the corresponding certification is perceived as credible (e.g. "Organic" $r_s = .21$, $p = 0.0000$; "Peanut free" $r_s = .16$, $p = 0.0000$; "GMO-free" $r_s = .19$, $p = 0.0000$).

The more the control mechanism of a certification is perceived to be binding, the more the corresponding certification is perceived as credible

Despite this relatively important lack of knowledge regarding control mechanisms, more than half of the respondents are in demand for more certifications and only 10% estimate that there is already enough certification, as illustrated by Table 21 below.

Table 21. Potential development of certifications	
Consumer opinion	**Proportion**
There are currently **not enough** certifications	**53%**
There are currently **enough** certifications	**37%**
There are currently **too many** certifications	**10%**

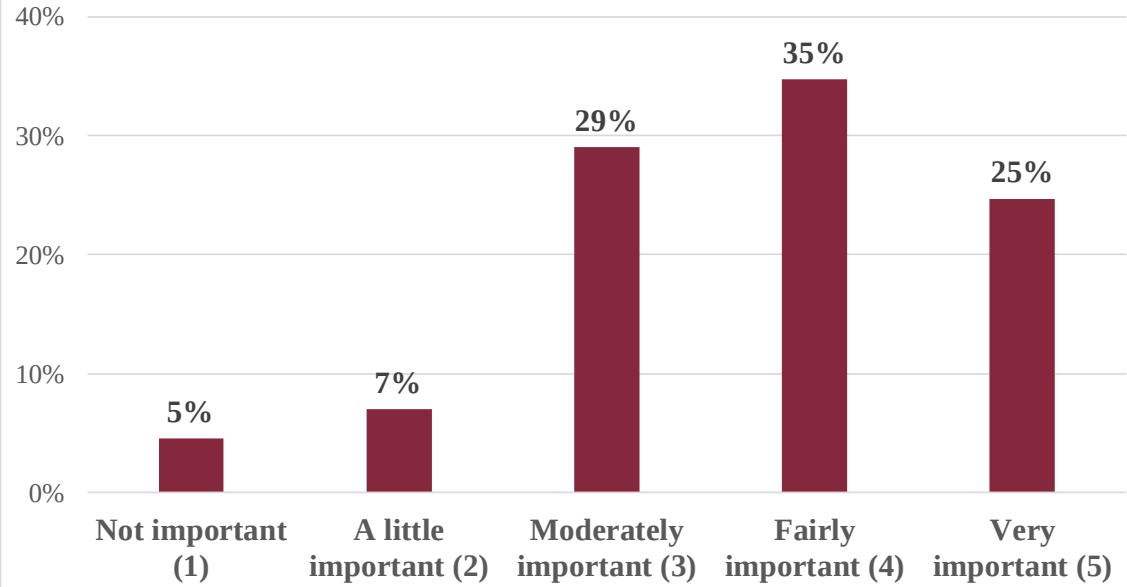
The age of the respondents seems to have a significant influence on their opinion about the current presence of food certifications. Older respondents have a higher tendency to estimate that there are not enough certifications than the younger ones (r_s = -.14, p = 0.0000). Perhaps they are more reassured by certifications, even though this has not emerged in the previous analysis of results presented by Figure 5. The presence of children also affects the opinion toward the current presence of certification. The proportion of respondents reporting that there are currently too many certifications is slightly, but significantly, higher for those having children (16%, p = 0.0000).

53% of the respondents consider that there are currently not enough food certifications.

Moreover, there is a significant correlation between the perception of the certification control mechanism and the opinion about certification development. Individuals believing that claims are mostly certified only on the basis of the producer's or the manufacturer's good faith have a tendency to estimate that there are already too many certifications (r_s = .14, p = 0.0000). **This might illustrate that there is some scepticism or cynicism among consumers regarding the meaning of certifications and reinforces the issue of consumer education about the real certification control mechanism.**

Respondents were then asked to rate the importance they give (from 1- Not important to 5- Very important) for a claim to be certified by an independent organization (third-party certifications). Results are presented in Figure 12.

Figure 12. Degree of importance for a claim to be certified by an independent body



A large part of the respondents (60%) estimate as fairly to very important for a claim to be certified by an independent body. This rating is influenced by some demographic variables. For instance, it is more important to older individuals that a claim be certified by an independent body than younger ones: 66% of the respondents older than 45 find a third-party certification fairly or highly important while 48% of the younger respondents have the same feeling (r_s = .18, p = 0.0000). This result is consistent with the previous one.

88% **of the respondents estimate as moderately important to very important for a claim to be certified by an independent body.**

Not only older respondents want more certifications, they want them to be granted by independent organizations. This is also observable globally for all respondents, as there is a significant and positive relationship between the opinion toward a potential development of certifications and the importance given to third-party certifications (r_s = .23, p = 0.0000).

There is a significant and positive relationship between the opinion toward a potential development of certifications and the importance given to third-party certifications.

Third-party certifications are also significantly more important to men than to women (M: 3.8 (1.0) – W: 3.6 (1.1), p=0.0031), and to

respondents without children (3.8 (1.0)) than those with children (3.5 (1.1), p=0.0000). Finally, the level of education has a significant and positive influence on the importance given to third-party certifications (r_s = .13, p = 0.0000).

Furthermore, there is a significant and positive correlation between the importance given to third-party certification and the perception of certification control mechanisms: the higher the importance of third-party certification, the more third-party organizations are perceived to be involved in the certification process (r_s = .15, p = 0.0000). **Perceptions of control mechanisms might therefore be based more on expectations than on actual knowledge. This emphasizes again the necessity to educate consumers on the process of certification for the claim they value for a more informed decision-making.**

Also, Table 22 below presents the correlation coefficients between the importance given to third-party certifications and change of behaviour as well as willingness to pay.

Table 22. Spearman's coefficients between CB/WTP and the importance given to third-party certifications

Importance of 3rd party certifications	vs CB	vs WTP
1- "Aliment du Québec"	.12***	.08**
2- "GMO free"	**.18*** **	**.15*** **
3- "Respect of animal welfare"	.12***	.11***
4- "Organic"	**.17*** **	**.18*** **
5- "Zero food fraud"	.10***	.10***
6- "PGI"	.15***	.10***

*Notes: n.s. if p > 0.05, * p<0.05, ** p<0.01, *** p<0.001*

As one can observe, a weak but positive and significant correlation appears between the importance given to third-party certifications and CB as well as WTP, for each tested certification. In other words, respondents who give more importance to third-party certifications have a tendency to be more willing to have their purchasing intentions positively influenced by certifications. For instance, considering the certification "Aliments du Québec", 75.5% of the respondents giving a fair to high importance to third-

party certifications are certainly willing to change, or have already changed, their purchasing behaviour against 58% for those whom third-party certification are a little to not important. For the "GMO free" and "Organic" certifications, these proportions become 51% - 30% and 44% - 27% respectively. Does that mean that respondents are ready to change and to pay more because they have the perception that these certifications are third-party certifications? According to the results, they do not seem to have a better knowledge of the certification process for these certifications, as if they would, no significant relationship should appear for second-party certifications, such as "IGP" or "Aliment du Québec". This, therefore, needs further investigation.

Respondents who give more importance to third-party certifications have a tendency to be more willing to have their purchasing intentions positively influenced by certifications.

Also, perceived risks and personal values are correlated with the importance given to third-party certifications, as reported below in Table 23. For example, it appears that individuals for whom other- and environment oriented values have more importance in their eating habits also tend to give more importance in third-party certifications.

Table 23. Correlation coefficient between the importance given to third-party certifications and perceived risks and values

	Third-party certifications
Risks	.18***
Self-Oriented Values	.16***
Other- and Env-Oriented Values	**.25*** **

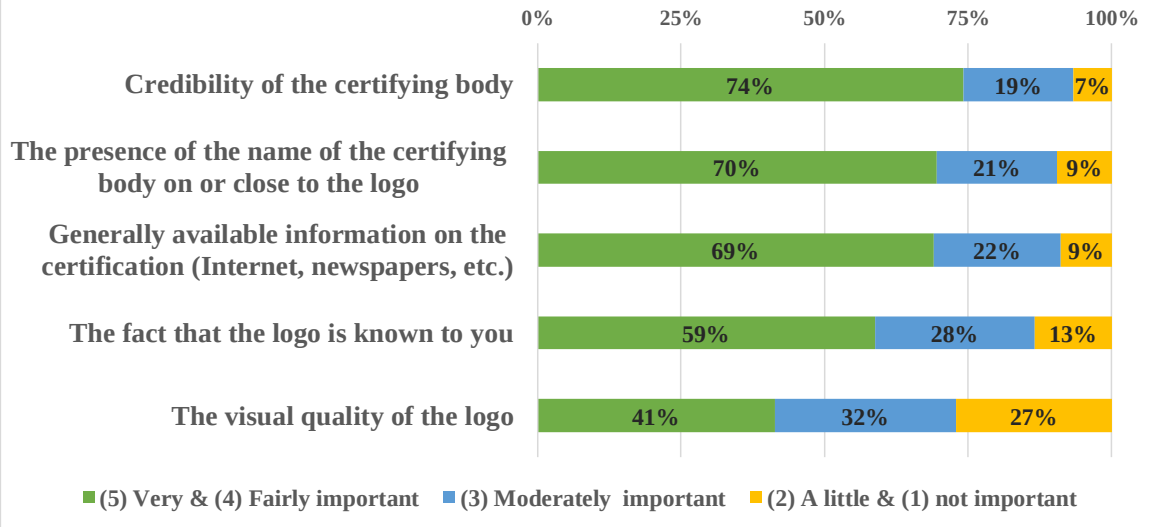
*Notes: n.s. if p > 0.05, * p<0.05, ** p<0.01, *** p<0.001*

The importance given by consumers to third-party certifications, especially when perceived risks and values are driving forces of their eating behaviour, is understandable. These certifications can be the symbol of a strict, high quality control system that tends to increase consumers' trust (Darnall *et al.*, 2016; Hatanaka *et al.*, 2005). Such trust, however, relies on a certification control system that is based on high quality procedures fostering independence and neutrality, among other aspects (Jahn *et al.*, 2005). From an organizational risk management point of view, and drawing from the CSR literature, third-party certifications can be a proactive strategy. Indeed, such certification can lead to the creation of a capital of trust, which has the potential to moderate blame attribution toward the organization benefiting from the certification in the event of a crisis (C. Janssen *et al.*, 2014).

5.2. Elements influencing the judgement of certifications credibility

This is particularly important as third-party organizations are greatly involved in the perception of the credibility of certifications. Indeed, respondents were asked to rate the importance (from 1- Not important to 5- Very important) of specific elements to judging the credibility of a certification. Figure 13 below presents the results.

Figure 13. Elements influencing the judgment of certification credibility



The credibility of the certifying body appears to be the most important element when judging the credibility of a certification. According to the literature, the perceived credibility of a seal is indeed closely related to the perceived credibility of the awarder of such seal (Moussa & Touzani, 2008). Consistently with previous results, older respondents give even more importance to the credibility of the certifying body than younger ones (r_s = .12, p = 0.0000). Furthermore, there is a positive and significant relationship between the importance of a third-party certification and the importance given to the credibility of the certifying body to judge certification credibility (r_s = .51, p = 0.0000).

74% of the respondents consider the credibility of the certifying body as very or fairly important when judging the credibility of a certification. It appears to be the most important element.

The second most important element for the respondents is the presence of the name of the certifying organization on or close to the logo. This underline the issue of 1- access to direct

information on the product or its package and 2- the identification of the certifying body and therefore a better judgment of its credibility. The third most important element is the access to remote information. This result is interesting as it has been discussed earlier (section 4.1) that remote information is not amongst the most important elements that reassure consumers about food quality (see Figure 5). A distinction should therefore be made between what consumers perceive to affect their judgment, which is also perhaps what they expect (access to information) and what they actually rely on in practice to judging credibility.

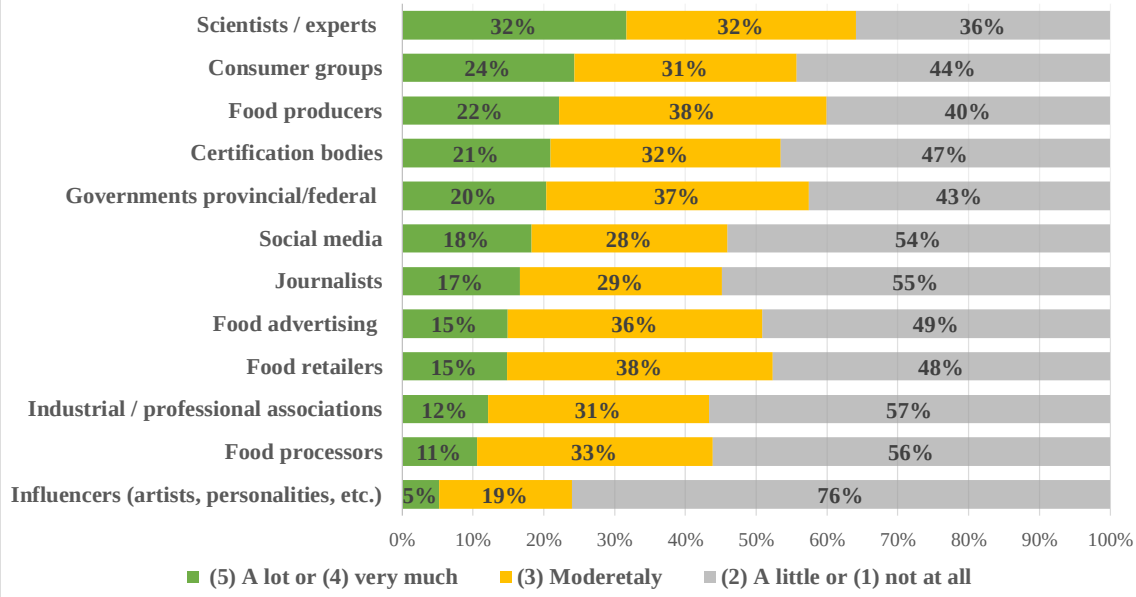
Finally, the familiarity of the logo appears only in fourth position before the visual quality of the seals. This result is also peculiarly interesting as it has been suggested earlier that credibility is strongly correlated with familiarity. This allows to nuance previous analyses. Indeed, are people more familiar with a certification because they find it credible and therefore have the habits to buy products bearing this seal, or do people give more credibility to a seal they have the habits to see in a market place? The answer to this question is complex as it is probably both. But a trend seems to appear, however: **individuals tend to rely a great deal on direct information and the fact that the name of the organization appears on the logo explicitly commits the certifier, such commitment surely influencing the perceived credibility of the certification.**

6

Consumers and information sources

Results from previous sections, especially 4.1 and 5, have clearly raised the issue of consumers' use of information. In response to that, the level of use and influence of different kinds of information sources that consumers consult to get informed about food-related issues are investigated in this section. Results regarding use and influence are presented in Figure 14 and Figure 15 respectively. A non-exhaustive but detailed list of existing online sources of information for Quebecker's consumers is presented in Table 28, Annex B.

Figure 14. Level of use of information sources



About 11% of the respondents use just a little or not at all the listed sources. Almost two thirds of the respondents (63%) use at least one source more than moderately and about 10% use at least one source a lot.

Looking at Figure 14, no strong consensus on information sources is observable, since no one clearly stands out for a majority of the respondents. Scientists and experts appear to be, however, the prime source of information, followed by consumer groups or associations. Older respondents have the tendency to rely more on the latter than younger ones, as illustrated in Table 24. Certification bodies are among the top 5 most consulted information sources, before government. Social media are also significantly used by respondents, especially younger ones (see Table 24). A similar observation can be made with influencers, which seem to be the least consulted sources in average. Finally, industrial or professional associations are among the least consulted sources, but are still used by a significant proportion of the respondents. This limited reach might be problematic for communication about certifications detained by such associations.

Certification bodies are among the top 5 most consulted information sources about food-related issues, before government. 21 % of Quebeckers consult them moderately to a lot.

Table 24. Influence of age on the proportion of respondents using specific information sources

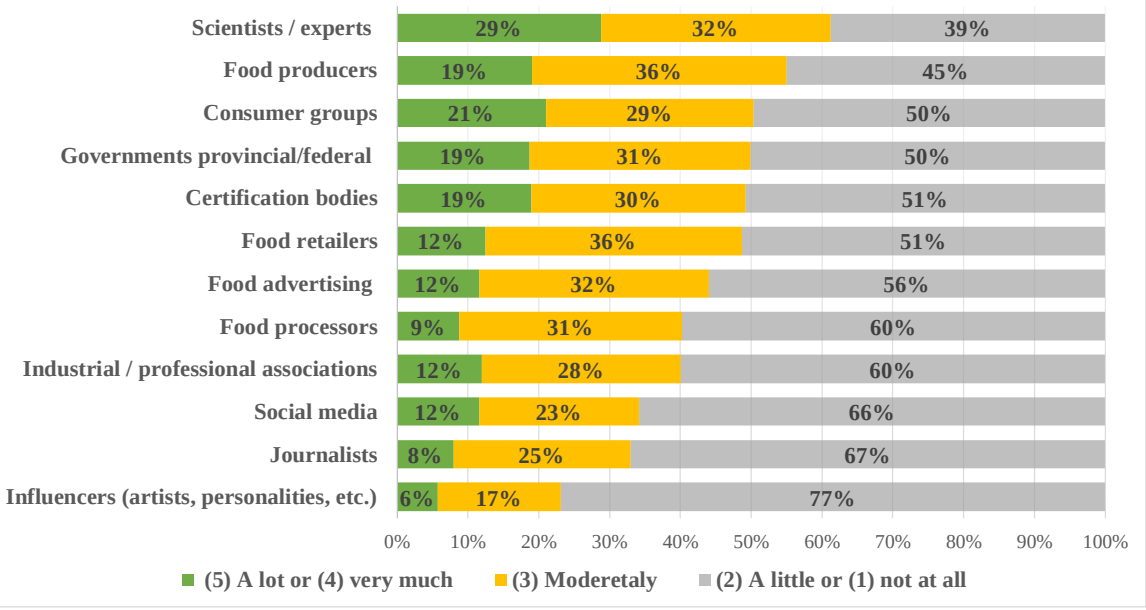
Sources	Age	More than moderately use	No use at all
Consumer associations	Over 55:	30%	23%
	Under 55:	20%	28%
	p = 0.0000		
Social media	Over 35:	12%	34%
	Under 35:	30%	16%
	p = 0.0000		
Influencers	Over 25:	5%	56%
	Under 25:	18%	39%
	p = 0.0000		

As presented by Table 24, age has a significant influence on the proportion of respondents using specific sources. Gender also seems to have an influence, although less important than the age, especially regarding the use of government and consumer association as information sources. This is presented in Table 25.

Table 25. Influence of gender on the proportion of respondents using specific information sources			
Sources	**Age**	**More than moderately use**	**No use at all**
Consumer associations	Men: Women: *p = 0.0022*	25% 21%	21% 30%
Governments	Men: Women: *p = 0.0039*	24% 19%	17% 23%

Figure 15 below shows the perceived influence of information sources on purchase behaviours.

Figure 15. Level of influence of information sources



One can observe in the magnitude of the perceived influence of each information source a potential correlation with the level of use of such source. This is confirmed by the highly significant correlation coefficients presented in Table 26.

Table 26. Average of use and influence of the sources of information

Sources of information	Use		Influence		Corr (r_s, p)	
Scientists / experts	2.89	(1.17)	2.79	(1.18)	0.70	***
Food producers	2.68	(1.06)	2.56	(1.05)	0.69	***
Governments provincial/federal	2.61	(1.14)	2.45	(1.15)	0.73	***
Consumer groups	2.60	(1.21)	2.47	(1.18)	0.75	***
Certification bodies	2.55	(1.14)	2.44	(1.11)	0.68	***
Food retailers	2.49	(1.02)	2.38	(0.99)	0.66	***
Food advertising	2.48	(1.03)	2.35	(0.96)	0.64	***
Social media	2.39	(1.13)	2.11	(1.05)	0.73	***
Journalists	2.34	(1.11)	2.00	(1.0)	0.65	***
Food processors	2.28	(1.01)	2.20	(0.97)	0.66	***
Industrial / professional associations	2.24	(1.10)	2.19	(1.06)	0.72	***
Food influencers (artists, personalities, etc.)	1.78	(0.97)	1.76	(0.96)	0.74	***

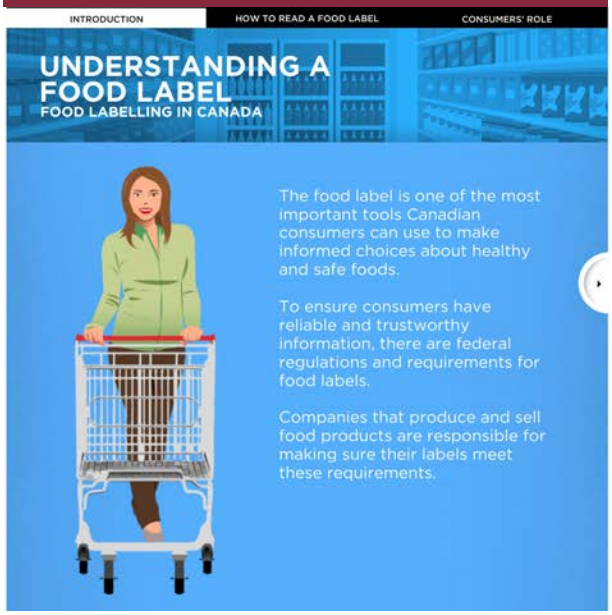
*Notes: *** p<0.001*

However, what kind of influence is implied here? It has been discussed in section 4.2 that credibility is strongly correlated to familiarity. It is therefore interesting to investigate the relation between the level of use of information from all sources with the level of familiarity with official seals. In average, it seems indeed that familiarity is positively and significantly correlated with the use of information (r_s = .33, p = 0.0000). Furthermore, it appears that there is no relation between the level of use and the knowledge of the certification process[29], discussed in section 5.

These results highlight again the current lack of consumer education regarding the meaning of a certification, the certification process and the control mechanisms, despite several interesting initiatives, from the federal government, for example. Thus, Figure 16 below presents the interactive tool developed by the CFIA for the understanding of food labelling.

[29] For the three certifications with a unique control mechanism: OGM free, Organic and Fair Trade.

Figure 16. Interactive tool - Understanding a Food Label (CFIA)[30]



Respondents were asked if they were aware of the existence of such tool. The result speaks for itself, as only 11.3% were aware its existence, with no clear influence of age or gender. The language, however, seems to have an influence, as English-native speakers were significantly more aware of its existence (20%) than native French speakers or allophones (10%, p = 0.0000). As well, being forced to adapt one's diet for food allergies reasons seems to have an influence, as 18% of the respondents suffering from food allergies are aware of this tool against only 9% of those who do not (p = 0.0003). Furthermore, among individuals knowing this tool, 40% never use it, and only about 20% use it often. This highlights the necessary distinction that should be made between information and education. Accessible sources of information do not necessarily mean that individuals will use it to educate themselves, which question the relevance of the development of new information tools.

10% of respondents are aware of the Government of Canada's interactive tool "Understanding a Food Label".

Among those who know it, 63% use it (18% often and 45% sometimes)

For example, respondents were asks if they would use a QR code, such as the one below, placed next to a certification seal to acquire more information about said certification.

[30] http://www.inspection.gc.ca/food/labelling/food-labelling-for-consumers/understanding-a-food-label/eng/1400530265966/1400530332584

Figure 17. Example of QR Code

54% of Quebeckers would certainly or probably not use a QR Code placed on a food product to acquire more information on the certification.

More than half the respondents (54%) would certainly or probably not use such tool, against 38% who would. 8% had no opinion on the question. Age has no strong determinant effect, except among those without opinion, as presented in Table 27.

Table 27. Influence of age on the potential use of QR codes as a source of information

Age	No, or probably not	Yes, or probably	No opinion
< 35	57%	40%	2%
35 to 55	56%	39%	5%
> 55	54%	32%	14%

These results ask in return how to effectively educate consumers, an issue also raised more than 40 years ago by Parkinson (1975). According to the author, this is the responsibility of an educative ecosystem composed of the school system, consumer protection organizations, continuing education programs, university services and civic and business services organizations. In the present context of increased concerns from consumers about food impact in their life, recurrent scandals in the agri-food industry as well as the globalisation of the food supply chain and the increasing amount of processed food products, this issue of consumer education is surely one of the most relevant, and one of the most urging to be addressed.

7. Recommendations and concluding remarks

Using a questionnaire answered by a representative proportion of the population in Quebec (N = 1032), the main objective of this study was to assess **the value of food certification and label for consumers**. Consumers' perceptions, choices and behaviours related to food are complex phenomena, which ask for nuanced analyses. While statistical analyses do not allow for straightforward conclusion on causal relationships, the results contained in this report surely help in the understanding of these phenomena.

The first key result is that **consumers in Quebec mainly use information directly accessible on the product** (such as list of ingredients and seals of quality) to judge food quality and are **reassured by local food products**. This finding highlight the importance of the issue of **transparency and traceability in food safety**.

In a recurrent manner, results have shown the relative importance given to the local products certification "Aliments du Québec" over organic or GMO free certifications. Especially for purchasing behaviour toward these certifications, this report has highlighted **the importance of the perceived risks and personal values as driving forces**. However, the primacy of the local products certification should not overshadow **the high potential of development for the organic and GMO free certifications, which is supported by the interest displayed by a large part of the respondent towards these two certifications.**

This is peculiarly relevant considering the legislative context in Quebec and the sensitive issue of mandatory labelling of GMO, as well as the recent legislative failures in Europe regarding GMOs used to feed livestock. A deficient control system might generate consumers mistrust in the agri-food industry. In this report, results have shown the importance given to third-party certifications by consumers. **If part of an adequate control system, it has been suggested that such certification have the potential 1) to increase consumers trust and 2) to be an efficient proactive strategy of risk management for the benefiting organization.**

Despite this, **the analyses of several results have clearly raised the issue of consumer education on a) certifications control mechanisms and b) the necessary distinction between the attributes of specific certifications**. More specifically, it has been suggested that the more the control mechanism of a certification is perceived to be binding, the more the corresponding certification is perceived as credible, whatever the real control mechanism. As well, the lack of distinction between attributes and meaning of different certifications has been discussed. These issues create risks of consumer deceptions, and hence highlight the issue of consumer education for their own safety and informed decision-making.

This also has direct implication for certification development. Indeed, it has been suggested that the perception of the certification control mechanism and the opinion about certification development are related. Individuals believing that claims are mostly certified only on the basis of the producers or the manufacturer's good faith have a tendency to reject certification development. This might illustrate that there is some scepticism or cynicism among consumers regarding the meaning of certifications and reinforces the issue of consumer education about the real certification control mechanism.

Finally, the analyses of the use and influence of information sources have suggested that **making information available is probably not enough to answer this question of consumer education adequately**. To face this timely yet enduring issue, a complex educative system should be put in place, in which certification organisations have surely an active role to play.

References

Antunes, P., Homsy, M., Mainville, L., & Scarfone, S. (2015). *The Agri-Food Industry - A Powerful Economic Development Lever for Quebec*. Institut du Québec

Arbulu, M. A., & Zimmerman, J. (2017). *Retail Foods - The Retail Landscape of Canada* (CA17002). USDA Foreign Agricultural Service - Global Agricultural Information Network

Batte, M. T., Hooker, N. H., Haab, T. C., & Beaverson, J. (2007). Putting their money where their mouths are: Consumer willingness to pay for multi-ingredient, processed organic food products. *Food Policy, 32*(2), 145-159.

Beavers, A. S., Lounsbury, J. W., Richards, J. K., Huck, S. W., Skolits, G. J., & Esquivel, S. L. (2013). Practical Considerations for Using Exploratory Factor Analysis in Educational Research. *Practical Assessment, Research and Evaluation, 18*(6).

Beltramini, R. F., & Stafford, E. R. (1993). Comprehension and perceived believability of seals of approval information in advertising. *Journal of Advertising, 22*(3), 3-13.

Bernard, J. C., Zhang, C., & Gifford, K. (2006). An Experimental Investigation of Consumer Willingness to Pay for Non-GM Foods When an Organic Option Is Present. *Agricultural and Resource Economics Review, 35*(2), 374-385.

Bernoussi, N. (2011). *Les labels informationels et leur impact sur les bénéfices, l'attitude envers la marque et la propension à payer.* (M. Sc.), Université de Sherbrooke.

Brown, K. M., Fenton, N. E., Lynd, L. D., Marra, C. A., Fitzgerald, M. J., Harvard, S. S., . . . Elliott, S. J. (2015). Canadian Policy on Food Allergen Labelling: Consumers' Perspectives Regarding Unmet Needs. *Universal Journal of Public Health, 3*(1), 41-48.

Campbell, B. L., Khachatryan, H., Behe, B. K., Dennis, J., & Hall, C. (2014). U.S. and Canadian Consumer Perception of Local and Organic Terminology. *International Food and Agribusiness Management Review, 17*(2), 21-40.

CARTV. (2011). *Signs of Quality Authorized in Québec as Reserved Designations*. Conseil des appellations réservées et des termes valorisants

CARTV. (2013a). *Guide de demande d'autorisation d'un terme valorisant (in French)*. Conseil des appellations réservées et des termes valorisants

CARTV. (2013b). *Guide de demande d'une appellation d'origine (AO) ou d'une indication géographique protégée (IGP) (in French)*. Conseil des appellations réservées et des termes valorisants

CARTV. (2016). *Les appellations Réservées depuis 2006*. Conseil des appellations réservées et des termes valorisants

Cattell, R. B. (1996). The Scree Test For The Number Of Factors. *Multivariate Behavioral Research, 1*(2), 245-276.

Choi, J., Lee, A., & Ok, C. (2013). The Effect of Consumer's Perceived Risk and Benefit on Attitude and Behavioral Intention: A Study of Street Food. *Journal of Travel and Tourism Marketing, 30,* 222-237.

Clark, P., & Hussey, I. (2016). Fair trade certification as oversight: an analysis of fair trade international and the small producers' symbol. *New Political Economy, 21*(2), 220-237.

Conner, M., & Armitage, C. J. (2006). Social psychological models of food choice. In R. Shepherd & M. Maats (Eds.), *The psychology of food choice* (pp. 41-57). Oxfordshire, UK: CABI.

CPAQ. (2017). *Programme de certification - Guide à l'usage des entreprises*. Conseil de la promotion de l'agroalimentaire québécois

Darnall, N., Ji, H., & Vázquez-Brust, D. A. (2016). Third-Party Certification, Sponsorship, and Consumers' Ecolabel Use. *Journal of Business Ethics*.

de Jonge, J., Frewer, L., van Trijp, H., Renes, R. J., de Wit, W., & Timmers, J. (2004). Monitoring consumer confidence in food safety: an exploratory study. *British Food Journal, 106*(10/11), 837-849.

de Jonge, J., van Trijp, J. C., van der Lans, I. A., Renes, R. J., & Frewer, L. J. (2008). How trust in institutions and organizations builds general consumer confidence in the safety of food: a decomposition of effects. *Appetite, 51*(2), 311-317.

de Marcellis-Warin, N., & Peignier, I. (2017). *Baromètre CIRANO 2017 sur la perception des risques au Québec* CIRANO.

Dodds, R., Holmes, M., Arunsopha, V., Chin, N., Le, T., Maung, S., & Shum, M. (2014). Consumer Choice and Farmers' Markets. *Journal of Agricultural and Environmental Ethics, 27*(3), 397-416.

Durochat, E., Stoll, J., Frois, S., Selvaradj, S., Lindgren, K., Geffner, D., . . . Smith, A. (2015). *Guide international des lables de commerce équitable*

Fromer, J. C. (2017). The Unregulated Certification Mark(et). *Stanford Law Review, 69*, 121-200.

Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate Data Analysis*. New Jersey, USA: Prentice-Hall International.

Hatanaka, M., Bain, C., & Busch, L. (2005). Third-party certification in the global agrifood system. *Food Policy, 30*(3), 354-369.

Hauser, M., Nussbeck, F. W., & Jonas, K. (2013). The Impact of Food-Related Values on Food Purchase Behavior and the Mediating Role of Attitudes: A Swiss Study. *Psychology and Marketing, 30*(9), 765-778.

Honkanen, P., Verplanken, B., & Olsen, S. O. (2006). Ethical values and motives driving organic food choice. *Journal of Consumer Behavior, 5*, 420-430.

Jacques, G. (2009). *Étude de perception et de consommation du miel au Québec et intérêt d'une marque assurant l'authenticité du miel produit au Québec.* ADN Stratégie-Conseil

Jahn, G., Schramm, M., & Spiller, A. (2005). The Reliability of Certification: Quality Labels as a Consumer Policy Tool. *Journal of Consumer Policy, 28*(1), 53-73.

Janssen, C., Sen, S., & Bhattacharya, C. (2014). Coroprate crises in the age of corporate social responsability. *Business Horizons*.

Janssen, M., & Hamm, U. (2011). Consumer perception of different organic certification schemes in five European countries. *Organic Agriculture, 1*(1), 31-43.

Kaptan, G., Fischer, A. R. H., & Frewer, L. J. (2017). Extrapolating understanding of food risk perceptions to emerging food safety cases. *Journal of Risk Research,* 1-23.

Loureiro, M. L., & Hine, S. (2002). Discovering Niche Markets: A Comparison of Consumer Willingness to Pay for Local (Colorado Grown), Organic, and GMO-Free Products. *Journal of Agricultural and Applied Economics, 34*(3), 477-487.

McCluskey, J. J., & Loureiro, M. L. (2003). Consumer Preferences and Willingness to Pay for Food Labelling: A discussion of Empirical Studies. *Journal of Food Distribution Research, 34*(3), 95-102.

Moussa, S., & Touzani, M. (2008). The perceived credibility of quality labels: a scale validation with refinement. *International Journal of Consumer Studies, 32*, 526-533.

Norberg, H. M., Maehle, N., & Korneliussen, T. (2011). From commodity to brand: antecedents and outcomes of consumers' label perception. *Journal of Product & Brand Management, 20*(5), 368-378.

Park, S.-Y., & Millar, M. (2016). The US traveler's familiarity with and perceived credibility of lodging ecolabels. *Journal of Vacation Marketing, 22*(1), 3-12.

Parkinson, T. L. (1975). The Role of Seals and Certifications of Approval in Consumer Decision-Making. *The Journal of Consumer Affairs, 9*(Summer), 1-14.

Pivato, S., Misani, N., & Tencati, A. (2007). The impact of corporate social responsibility on consumer trust: the case of organic food. *Business Ethics: A European Review, 17*(1), 3-12.

Ringquist, J., Phillips, T., Renner, B., Sides, R., Stuart, K., Baum, M., & Flannery, J. (2016). *Capitalizing on the shifting consumer food value equation.* Deloitte Consulting LLP, Food Marketing Institute & Grocery Manufacturers Association

Rodier, F. (2010). *Mesure de l'impact de la marque de provenance Aliments du Québec sur la valeur des produits.* (DBA), Université de Sherbrooke et Université du Québec à Trois-Rivières.

Rogers, P. J., & Blundell, J. E. (1990). Psychobiological bases of food choice. *BNF Nutrition Bulletin, 15*(Supplement 1), 31-40.

Saba, A. (2001). Cross-Cultural Differences in Food Choice. In L. J. Frewer, E. Risvik, & H. Schifferstein (Eds.), *Food, People and Society*: Springer, Berlin, Heidelberg.

Sirieix, L., Delanchy, M., Remaud, H., Zepeda, L., & Gurviez, P. (2013). Consumers' perceptions of individual and combined sustainable food labels: a UK pilot investigation. *International Journal of Consumer Studies, 37*(2), 143-151.

Sobal, J., Bisogni, C. A., Devine, C., & Jastran, M. (2006). A conceptual model of the food choice process over the life course. In R. Shepherd & M. Maats (Eds.), *The psychology of food choice* (pp. 1-18). Oxfordshire, UK: CABI.

Tonkin, E., Wilson, A. M., Coveney, J., Webb, T., & Meyer, S. B. (2015). Trust in and through labelling – a systematic review and critique. *British Food Journal, 117*(1), 318-338.

Van Rijswijk, W., & Frewer, L. J. (2012). Consumer needs and requirements for food and ingredient traceability information. *International Journal of Consumer Studies, 36*, 282-290.

Walley, K., Parsons, S., & Bland, M. (1999). Quality assurance and the consumer: A conjoint study. *British Food Journal, 101*(2), 148-162.

Yeung, R., Yee, W., & Morris, J. (2010). The effects of risk-reducing strategies on consumer perceived risk and on purchase likelihood: A modelling approach. *British Food Journal, 112*(3), 306-322.

Annexes

Annex A – Demographic description of the sample

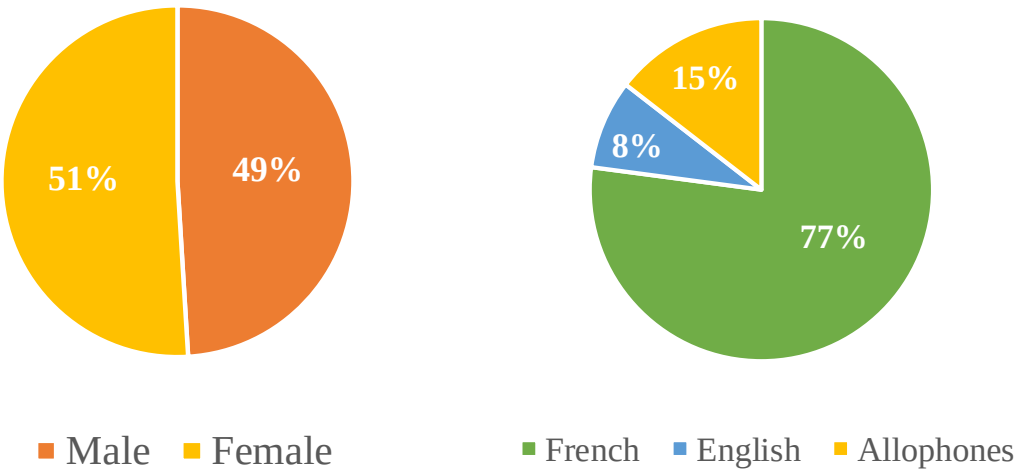


Figure 18. Gender and language of the respondents

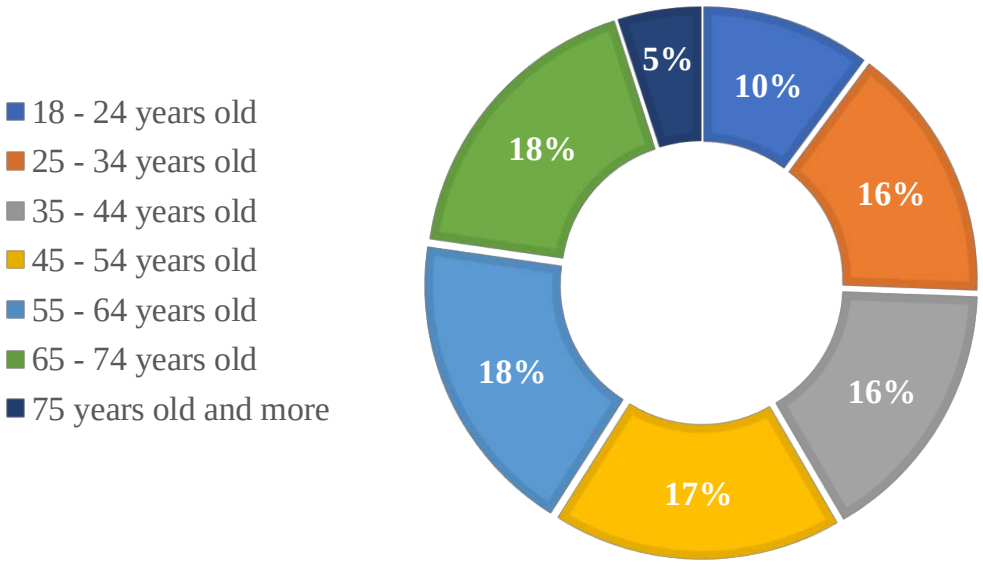


Figure 19. Age of the respondents

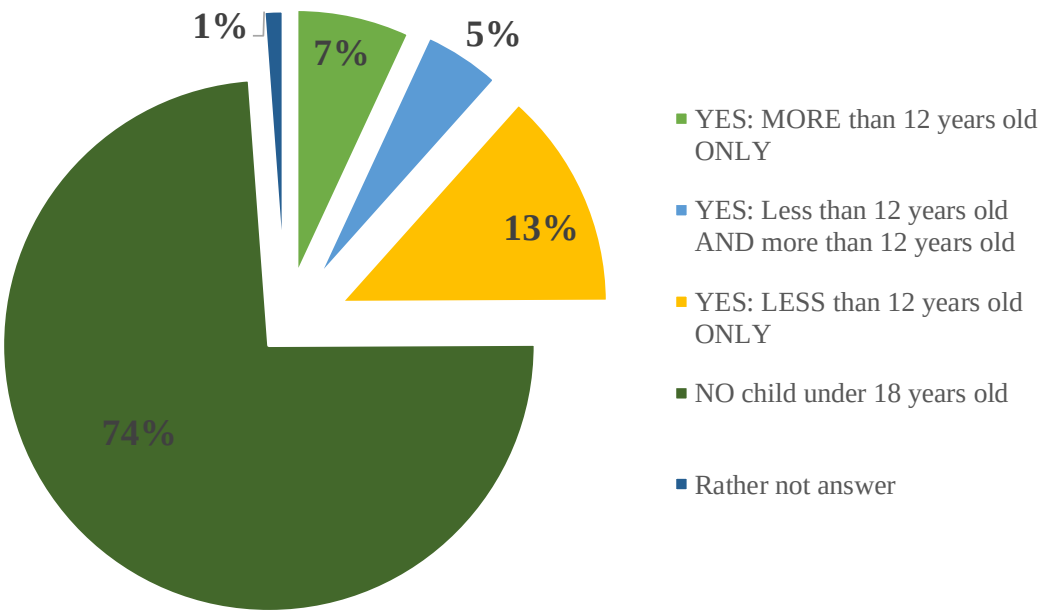


Figure 20. Presence of minor children

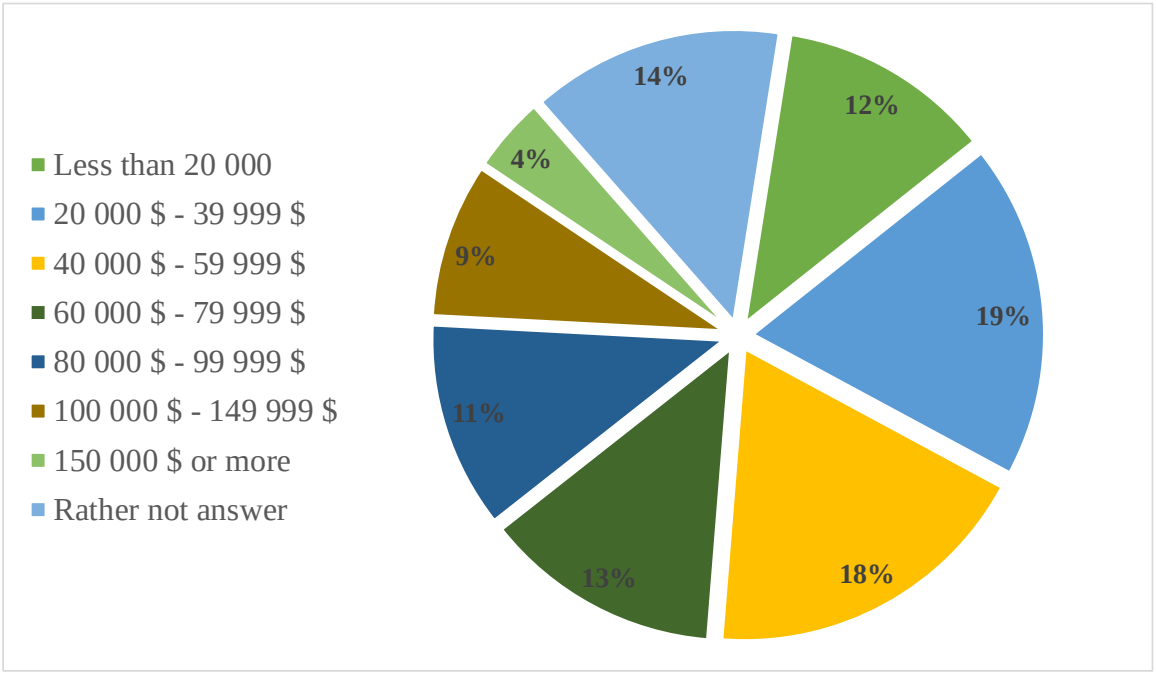


Figure 21. Level of family income

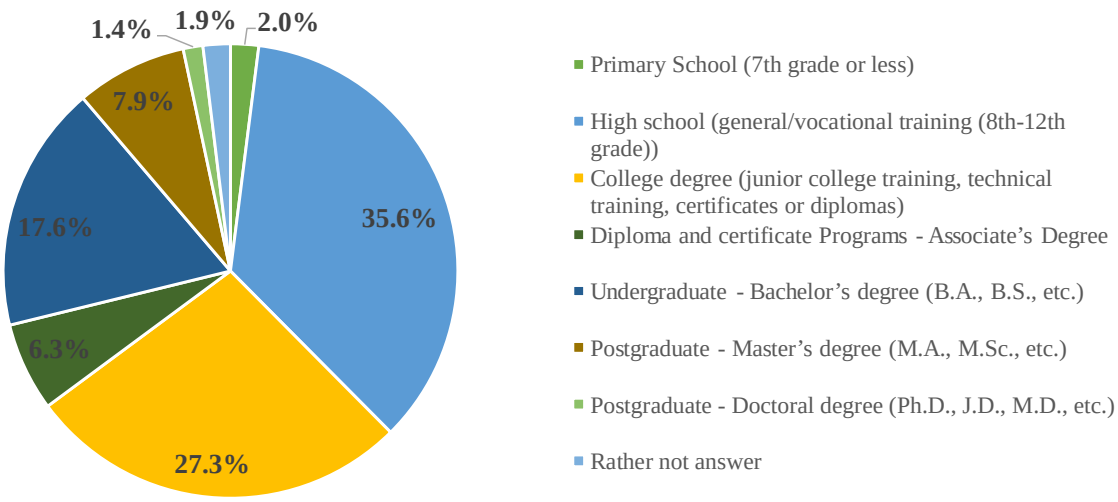


Figure 22. Level of education

Annex B – Online sources of information for the consumers

In addition to official governmental websites and publications, several information sources are available online for the consumers. Table 28 presents a non-exhaustive list of websites from consumer or producer associations, non-profit organization and the government.

Table 28. Online information sources

Consumers associations	
Consumers' association of Canada	http://www.consumer.ca/
Protégez-vous	https://www.protegez-vous.ca/
Organic and/or Fairtrade products	
Equiterre	Major environmental non-profit organization in Quebec. https://equiterre.org/
Organic Federation of Canada	Association for the defense of the organic agri-food industry and for the promotion of organic food in Canada http://www.organicfederation.ca/
Canadian Organic Growers	National charitable organization for the support of local and national communities toward sustainable organic stewardship of land, food and fibre. http://www.cog.ca/
Portail Bio Quebec	Information system about the organic sector in Quebec. http://www.portailbioquebec.info/
Répertoire des produits biologiques certifiés au Québec	Database for organic products in Québec. http://www.produitsbioquebec.info/interroGrandPublicFr.do
CETAB+	Center of expertise and transfer in organic and local agriculture, with the largest French database regarding organic and sustainable agriculture. https://www.cetab.org/
The Canadian Fair Trade Network	Non-profit organization for the promotion of relationship, knowledge and action to develop fair trade in Canada http://cftn.ca/
AQCE	Quebec association for fair trade. http://www.assoquebecequitable.org/
Choisir Équitable	Promotion campaign for fair trade. http://choisirequitable.org/

Table 9. Information sources (Continued)

OGM

Vigilance OGM	Quebec network for information, awareness and action regarding GMO and pesticides. https://www.vigilanceogm.org/
Government of Quebec	Governmental site for GMO information. http://www.ogm.gouv.qc.ca/index.html

Government agency or department

CFIA	http://www.inspection.gc.ca/
CARTV	http://www.cartv.gouv.qc.ca/
MAPAQ	http://www.mapaq.gouv.qc.ca/fr/Pages/Accueil.aspx
CPAQ	https://www.alimentsduquebec.com/fr/
	https://lequebecbio.com/

Annex C – Details on results interpretation

C.1. Differences between groups

What is a statistically significant difference between groups, say native French speakers, native English speakers and allophones? In statistics, a result is said to be statistically significant when it is unlikely to obtain it by mere chance. Usually, a probability threshold *p* of 0.001 to 0.05 is used, which means that the result observed has less than a 0.1% to a 5% chance of being obtained by chance. It is therefore considered significant. In contrast, an insignificant result is one that was probably – at more than 5% – obtained by chance.

For example, in section 4.1.1, it is suggested that native French speakers, native English speakers and allophones are differently reassured by the local origin of a product (French and English: 46%, Allophones: 33% p=0.02). This result means that the same proportion (46%) of native French speakers and native English speakers have selected “locally made products” as one of the three most reassuring elements regarding food quality while a lesser proportion (33%) of allophones has done the same, and that there is a probability of only 2% that this difference was obtained by chance.

Some results are given using the mean value for the variable instead of the proportion of respondents having answered a given value. The aim is the same: comparing groups. For example, in section 4.1.2., the level of importance for different claims is analyzed. For this question, respondents were asked to rate the importance they give to 17 different types of claims: 1- not important, 2 - a little important, 3 - moderately important, 4 - fairly important and 5- very important. Then, it is suggested, for instance, that the “locally grown” claim is more important for women than for men (W :3.87 (1.1) – M :3.66 (1.1), p=0.002). The average rating for men (3.87) is indeed closer to 4 (fairly important) than for women (3.66), this difference having a probability of 0.2% of being due to chance. The numbers between brackets is the standard deviation, a measure of the dispersion of all data around the mean.

Significant elements are usually indicated with stars: the more significant the element, the higher the number of stars on the *p* according to the following thresholds: * if $p < 0.05$, ** if $p < 0.01$ and *** if $p < 0.001$.

C.2. Correlation between two variables

Correlations are used to test the relationship between two variables, to assess to what extent they are related. For example, how choosing a specific element as being one of the most reassuring regarding food quality is related to being older. It is not, however, systematically a representation of a *causal* relationship. It is not because people are older that they have chosen a specific element. An unconscious and unrevealed experience or perception related with being older is more likely the original cause. A classic example is the correlation between ice cream and sunglasses purchases during the summer. One is not the causation of the other (in this case, it is a third variable: the weather). The issue in a correlation analysis is therefore to explain a relationship correctly.

In our study, considering the nature of our variables, spearman's rank correlation tests have been used. The value of the coefficient r_s is a representation of the strength the relation. The interpretation is made according to the following thresholds: $0.1 < r_s < 0.3$: small, $0.3 < r_s < 0.5$: moderate and $r_s > .5$: strong. The probability that this relation was obtained by chance is analyzed using the same parameter as above, the *p*-value, with the same levels of significance.