Can-Trace Multi-Ingredient Working Group White Paper

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1. Introduction:

The Can-Trace Multi-Ingredient White Paper report was prepared in order to:
- Examine the issues and challenges associated with multi-ingredient products.
- Assess whether the Canadian Food Traceability Data Standard, Version 1.0 (CFTDS v 1.0) needs to be modified to accommodate multi-ingredient products.

In addition to the two key issues identified above, the Can-Trace Multi-Ingredient White Paper also addresses questions such as:
- What are the needs of those conducting traceability of multi-ingredient products and are they different from the needs of those conducting traceability of "single-ingredient" products?   If so, how?
- Would companies be willing to share traceability models that might be helpful?   Without probing into company-proprietary data or systems, how is multi-ingredient tracing done today?
- What are the key components of a successful solution for multi-ingredient traceability?
- Are there any examples of the CFTDS v 1.0 being applied for multi-ingredient traceability?
- Is the CFTDS v 1.0 sufficient for multi-ingredient traceability or is there a need to revise the standard and the data elements to accommodate multi-ingredient traceability?
- How does the industry deal with "breakdowns" in information from suppliers to processors, and how is information from suppliers "validated" to ensure accuracy and quality?

At the October 13, 2005 teleconference, the Multi-Ingredient Working Group agreed that the information contained in this white paper would be collected by means of a detailed survey questionnaire. The questionnaire's objective and the format were also approved during this call.

The objective of the survey questionnaire was to provide the framework for assembling and analyzing the information collected by the consultants while surveying the multi-ingredient processors.
The survey questionnaire was designed to assess the issues and challenges from the following perspectives:

I.   The nature of the company and the product(s) produced.
II. The nature of the ingredients.
III. The objectives and requirements of a company's traceability program.
IV. The processes used to collect, keep and share traceability data.
V.   Ingredient and product identification.
VI. A GAP analysis of the data elements used for traceability by the companies compared to the mandatory data elements recommended in the CFTDS v 1.0.

Seven survey questionnaires were completed. Due to the fact that the some of the participants requested that their individual responses remain anonymous, the authors of this white paper were not at liberty to publish the individual company responses in detail. Consequently, the survey results are presented and discussed in a summary format.

The survey results indicate that:

a) The surveyed companies represent a sound cross-section of multi-ingredient processors relative to the issues and challenges which were assessed. It is significant to note that all the companies use HACCP-based systems and that the main purpose of their traceability systems is to facilitate product recalls. Most of the companies surveyed import ingredients and export products internationally. It is the consultants' conclusion that the survey results represent the issues and challenges faced by a broad range of multi-ingredient processors in Canada.

b) While none of the companies have implemented the CFTDS v 1.0, the traceability data which they collect, share and keep is virtually identical to the mandatory data elements recommended in the CFDTS v 1.0. Based on these results, it is the consultants' conclusion that the CFTDS v 1.0 does not need to be modified in order to accommodate multi-ingredient products.

c) Breakdowns in the traceability process occur most frequently with suppliers and are due primarily to the inconsistent, non-standard use of labeling formats to identify ingredients. Unlike "single-ingredient" products, multi-ingredient processors must deal with the complexity of having to track and trace large numbers of ingredients for each product produced. A high percentage of ingredients are imported and a high percentage of products are exported. The majority of companies still collect and store traceability data manually. Based on these results, it is the consultants' conclusion that multi-ingredient processors would benefit from implementing the CFTDS v 1.0 using its "best practices". The "best practices" recommend the use of the international GS1 data standards (formerly EAN.UCC data standards) for ingredient and product identification, using standard bar codes to collect the data electronically. Implementation of the CFTDS v 1.0 using the GS1 data standards would also facilitate the synchronization of data between suppliers, processors and customers, in addition to simplifying supplier validations.

d) None of the companies have implemented the CFTDS v 1.0. No two companies used the same data standards to implement their traceability systems. The majority of companies are planning modifications to their traceability systems. Almost half of the companies surveyed are willing to share their traceability systems with Can-Trace. Based on these results, it is the consultants' conclusion that an opportunity exists for Can-Trace to sell the benefits of implementing the CFTDS v 1.0 – using the international GS1 data standards – to multi-ingredient processors in Canada. The consultants recommend that Can-Trace conduct a more detailed study with the companies willing to share their traceability systems in order to demonstrate the benefits of implementation of the CFTDS v 1.0 using the GS1 data standards. The deliverable of this study would be a "How to Guide", which Can-Trace can use to encourage multi-ingredient processors to implement the standard.

2. A General Description of the Canadian Food Traceability Data Standard:

Objectives:

Can-Trace's objective is to define and develop minimum information requirements for a national, whole-chain, all-product traceability standard based on the globally recognized GS1 System (formerly the EAN.UCC System). Specifically, this voluntary standard will establish the minimum data elements required to be collected, kept and shared between trading partners.

Functional Requirements:

The standard is based on the one up/one down traceability model of collecting, keeping and sharing traceability information.

Units are traced for purposes such as product recalls and complaints.

The standards document "Canadian Food Traceability Data Standard, Version 1.0" contains background information and data concepts used to explain how to use this standard.

The important data concepts behind the standard refer to:

Basic Elements Of Traceability:

The basic elements of traceability include product, party and location identifiers.

They are used in the one up/one down traceability model of sharing traceability information by assigning identifiers to a product, relating them to their predecessor, and recording and sharing them with supply chain partners. As products move along the supply chain and are transformed by different supply chain participants at different locations, new product, party and location identifiers are assigned and linked to their predecessors.

There are many ways to assign, record and store identifiers. The CFTDS v 1.0 allows for the generic use of the identifiers as well as for the use of international GS1 data standards for product, party and location identification.

The CFTDS v 1.0 is based on a data dictionary that consists of 24 data elements. Can-Trace recommends the use of the following eight mandatory data elements:

Mandatory Data Elements:

No	Data Attribute Name	Data Attribute Definition
3	Buyer Identifier	A number or code that uniquely represents the party purchasing the product.
9	Lot Number	A number or code assigned to uniquely represent a batch or group of inputs, products, and/or outputs. The Lot Number is generally assigned by the company or individual creating the goods.
10	Product Description	A description of the product (no pre-defined format is used).
11	Product Identifier	A number or code that uniquely represents a commercial trade Item. For farm products: The product identifier uniquely distinguishes individual units of production (eg. animal, bin, catch, flock). For processed or finished goods: The product identifier represents a seller's retail trade item (or product); or non-retail trade item (such as the case or master carton).
12	Quantity	Count, net weight, or net volume of an identified product (trade item).
17	Shipment Identifier	A number or code that uniquely distinguishes a product shipment. May be linked to a lot number.
20	Unit of Measure	Description of the units in which a quantity is being expressed. Note: Where this measure is used to describe weight, volume or count, a "net" value is applied. The term "net" is taken to mean the product exclusive of its container or packaging.
23	Vendor/Supplier Identifier	A number or code that uniquely represents the party selling the product.

The complete data dictionary and other pertinent information are included in Appendix A.

3. Survey Questionnaire Description:

I. The Nature of the company and the product(s) produced
a) Based on volume manufactured, are you considered a small, medium or large manufacturer?
b) In what form do you sell your finished products (eg. prepackaged, frozen, fresh, ready-to-eat, for further processing, etc.)?
c) What is your target market (eg. local, national, and/or foreign)?Approximately what percentage of your target market does each of these markets represent?
d) Who are your main customers (eg. foodservice, retail, HRI, value added, bulk, etc)?
e) What certifications are you currently operating under (eg. HACCP, ISO, customer certifications, etc.)?

II. The Nature Of The Ingredients
a) What type of ingredients do you use (eg. raw material, processed, dry, wet, etc.)?
b) Where are your ingredients sourced from (eg. local, national, foreign)?
c) What is the average number of ingredients per product manufactured?

III. Traceability Programs
a) Does one exist?
b) What standards were used during its development (eg. HACCP, ISO, customer specifications, CTDS v 1.0, etc.)?
c) What is the purpose of the program (eg. to meet customer and/or certification specifications, establish a recall process, establish a branding process, etc)?
d) What level of traceability do you operate under (eg. one up/one down, two up/two down, etc.)?
e) Do you perform supplier validations? Yes/No.
   i.If Yes, how often and what standards do you use (eg. on-site verification, third party audit reports, written guarantees, etc.)?
f) Are you familiar with Can-Trace initiatives?
g) Are your customers familiar with Can-Trace initiatives?
h) If you are an exporter, is your system capable of satisfying traceability requirements outside of Canada and North America?

IV. Traceability Data Processes
a) What information do you collect on incoming ingredients (eg. lot codes, dates, condition, cost of acquisition, etc.)?
b) Where do you collect this information from (eg. shipping, office, electronically, etc.)?
c) How do you collect this information (manually, electronically, other)?
d) Where is the information stored (electronically, hard copy, other)?
e) Who has access to the information (eg. senior management, production personnel, quality assurance, customers, auditors, etc.)?
f) How long do you keep the information on file (eg. shelf life of the product, until shipped, one year, etc.)?

V. Ingredient And Product Identification

a) Is the labeling consistent among your ingredient suppliers (i.e do they all use the same format)?
b) Are your ingredients easily identified in storage (eg. inventory control)?
c) Are your ingredients easily identified during processing (eg. batch reconciliation)?
d) Are your ingredients easily identified in the finished product and/or during distribution (eg. is there a link between the ingredients received and the final product being shipped)?
e) Are you planning on making any significant changes to your traceability process? Yes/No
   ii.If Yes, is it related to efficiency, quality or other?
f) Without sharing company proprietary data or systems, would you be willing to share your traceability model?
g) What areas do you feel allow for "breakdowns" in the traceability process (eg. suppliers, storage, processing, shipping, distribution, transport, customers, etc.)?

VI. Can-Trace Data Element Gap Analysis for each data element in the Can-Trace Data Dictionary

a) Do your traceability data elements use the same terminology as the CFTDS v 1.0?
b) Do your traceability data elements have the same function as the CFTDS v 1.0?
c) Are all of your traceability data requirements included in the CFTDS v 1.0?
d) What would be required in order for your company to implement the CFTDS v 1.0?

4. Survey Methodology:

The individual surveys were conducted as follows:

a) The consultants conducted an initial telephone call in order to introduce and explain the purpose of the survey and the Can-Trace Multi-Ingredient White Paper.
b) Some of the participants requested - and were e-mailed - a copy of the survey questionnaire to review and prepare preliminary answers.
c) The consultants conducted the survey with the participants by telephone and recorded the answers.

5. Participants:

The surveys were conducted during November 2005. The following seven companies participated in the survey:

a) Smucker Foods of Canada Co.
b) Nestlé Canada
c) ACA Co-operative Ltd.
d) Olymel
e) Griffith Laboratories Ltd.
f) Cambridge Fine Foods
g) High Liner Foods Inc.

6. Survey Results:

The consultants have chosen to present the results in a summary format due to the fact that some of the participants have requested that their individual responses remain anonymous. The consultants have included their own comments following the summary response to each question. These comments express the opinions of the consultants regarding how the responses relate to the implementation of the CFTDS v 1.0 for multi-ingredient processors.

Section 1

was designed to provide a basic description of the company's product(s) and the market for that/those product(s). This information will provide a background of the different types of companies and emphasize company traceability protocols.

Q1a. Based on volume manufactured, are you considered a small, medium or large manufacturer?

Result
- Large: 3
- Medium/large: 1
- Medium: 2
- Small/medium: 1

Comments: These results represent the participants' perceptions. If the company size categorization were done based on the number of employees, these groupings would still hold true, with the exception of the answers medium and medium/large. If the number of employees was used as the criteria, the size categorization would be as follows:

- Large: 3
- Medium: 2
- Small: 2

This is an objective indicator of company size as opposed to the participants' perception of their business' size. Considering the nature of modern multi-ingredient processing and manufacturing companies (large scale, diverse and export oriented), this is considered a sound cross-section.

Q1b. In what form do you sell your finished product?

Result – Choices given were: Prepackaged, frozen, fresh, ready to eat (RTE), for further processing (FFP).
- All types: 2
- RTE, FFP, frozen, prepackaged: 1
- RTE, FFP, prepackaged: 1
- Prepackaged, frozen: 2
- FFP: 1

Comments: Based on product type, this is once again a good cross-section of companies. The companies who answered "all types" would conceivably have greater traceability challenges since they are marketing a more diverse product from a marketing and distribution standpoint. All participants produced a prepackaged product.

Prepackaged is defined as a non-bulk product. From a product identification perspective, there is less of a need to maintain one up traceability for prepackaged products.

Q1c. What is your target market?

Result – Choices given were: Local, national, foreign
- All companies produce products for the national market
- Five of the seven companies produce products for export outside of Canada
- Two of the seven companies produce products for local (provincial) markets

Comments: This question was asked to provide context for the scope and requirements of company traceability systems. Scope refers to interprovincial and international requirements for product traceability. The fact that all companies are producing and marketing products across provincial borders and five of the seven are exporting products outside of Canada provides a strong test for the relevance and applicability of the CFTDS v 1.0. If none of the companies were exporting outside of Canada, there would be justifiable concerns as to the relevance of the CFTDS v 1.0 for multi-ingredient manufacturers in export markets.

Q1d. Approximately what percentage of your target market does each of these markets represent?

Result – All companies are heavily focused on the national market, with six of the seven companies stating that 60% or more of their products are marketed nationally. Four of the seven companies stated that they market over 80% of their products nationally. Four of the seven companies indicated that foreign markets (exports) constitute 20-40% of their target market, with one company stating that the foreign market represents 5% of its target market.

Comments: This question relates to question 3h, in that standards used in company traceability systems are without exception (all seven participants) accepted or eligible for product export. The inference is that if companies use standards similar or the same as those found in the CFTDS v 1.0, and are eligible for export, the CFTDS v 1.0 is therefore acceptable in terms of the export of multi-ingredient products.

Q1e. What certifications are you currently operating under?

Result – Choices given were: HACCP, ISO, customer certifications.
- All companies were operating under a HACCP-based system

Comments: Two of the seven companies stated they have CFIA or FSEP certification, five of the seven companies stated that HACCP-based systems were in place. FSEP (Food Safety Enhancement Program) is a program that has been prepared for CFIA inspection teams and includes development and application of HACCP-based models. As used in this survey, these terms are interchangeable, which implies that all companies are using HACCP-based certification systems. For a general overview of HACCP, please visit:
http://www.inspection.gc.ca/english/fssa/polstrat/haccp/haccpe.shtml

Section 2

(The Nature Of The Ingredients) was designed to collect information on the type and number of ingredients a company uses in the production process. This section confirms that the companies surveyed are in fact multi-ingredient organizations and provides a simple picture of the ingredients used.

Q2a. What types of ingredients are used?

Result – Choices given were: Raw, processed, dry, wet. Six of the seven companies stated using all of these types of ingredients, one of the seven uses only dry and wet ingredients, with no reference to raw or processed products (although this is implied).

Comments: The uniform response of a broad use of materials bodes well for the survey results. A narrow use of ingredient types would again leave some doubt regarding the application of the CFTDS v 1.0.

Q2b. Where are your ingredients sourced from?

Result – Choices given were: Local, national, foreign. All seven companies source materials nationally, six of the seven companies source materials from foreign producers, four of the seven companies source materials locally.

Comments: This question provides context for data recording and data transfer requirements. More specifically, the compatibility of the CFTDS v 1.0 with international (foreign) data collection is very important given the high percentage of companies that source ingredients from outside of Canada.

Q2c. What is the average number of ingredients per product manufactured?

Result – Varied responses, ranging from four to 20+, "minimum four to five" (one company), "maximum 20+" (two companies), "average five to 15" (four companies).

Comments: This question provides context for the complexity of the traceability system needed based on the number of ingredients required per product, as opposed to the total number of ingredients a manufacturer would purchase. This implies a degree of complexity required for product recalls; the more ingredients there are, the greater the potential for recall issues, the more complex the record-keeping required for the final product. The range of responses indicates a broad test of the CFTDS v 1.0.

Section 3

(Traceability Programs) provides information on the company traceability programs and attempts to discover the level of awareness of Can-Trace and the CFTDS v 1.0.

Q3a. Do you have a traceability program?

Result – All companies have a traceability program; one company responded that the program was integrated with their HACCP program.

Comments: This question provides context for the existence of a program; if no program exists, there is no opportunity for the use of the CFTDS v 1.0. The fact that all companies have a traceability program indicates that Can-Trace is relevant and has potential to positively impact multi-ingredient companies.

Q3b. What standards were used during its development?

Result – Again, there was a very broad response pattern for this question. No two companies reported using the same standards; responses ranged from "none" to "HACCP/CFIA", to "in house", to "ISO and FDA".

Comments: From Can-Trace's standpoint, these responses can be viewed either as an opportunity or an indication of industry inconsistency. The opportunity lies in Can-Trace's ability to present a consistent and repeatable data standard for traceability that can form the backbone of all traceability systems. It should be understood that the question was asking the systems' standards, not the design of the systems themselves.

Q3c. What is the purpose of the program?

Result – All companies (seven out of seven) stated that their programs are used for product recall purposes, while two of the seven companies also indicated using their programs for better inventory control, and one of the seven stated using their program to enhance consumer safety.

Comments: There is strong indication that the CFTDS v 1.0 should facilitate product recalls for multi-ingredient companies. There is a periphery benefit for inventory control but the clear signal from these companies is that the traceability systems are for product recalls. This is consistent with the objectives of the CFTDS v 1.0.

Q3d. What level of traceability do you operate under?

Result – All seven companies use a one up/one down system. The one down system depends on the ingredients being sourced; some go to the primary producer of the product, while other go only to the previous processor.

Comments: This result supports the Can-Trace concept of one up/one down traceability and the format under which the data standards were developed.

Q3e. Do you perform supplier validations?

Result – This question refers to whether or not the multi-ingredient processors actively examine their supplier data collection systems. Five of the seven companies perform supplier validations although not all to the same level. For example, two of the companies do so only for certain ingredients and only if the ingredient is a primary one. Two of the seven companies do not perform supplier validations in any form.

Comments: Given the one up/ one down format, it would seem that supplier validations (for data collection standards) would be required for all companies. The fact that not all companies perform these validations suggests that there is potential for data inconsistencies. CFTDS v 1.0's format is such that the shared data needs to be collected and recorded in a consistent format. This is a potential area for improvement and Can-Trace may wish to encourage supplier validations for data collection consistency. In cases where companies answered "yes", the reasons given included "level of risk of ingredients" (food safety) and "source of ingredients" (outside of the country).

Q3f. Are you familiar with Can-Trace?

Result – Four of the seven companies stated that they were familiar with Can-Trace, three of the seven said that they were not, and one of the three said that they had heard of Can-Trace.

Comments: Given the fact that the CFTDS v 1.0 is voluntary, the response is encouraging for Can-Trace. It is difficult to have 100% recognition with a voluntary set of standards. However, the sample set of responses is skewed to companies that have had previous exposure to Can-Trace, therefore the results are somewhat surprising. Can-Trace may wish to increase its exposure to multi-ingredient companies; mandatory application of the standards would accomplish this very quickly.

Q3g. Are your customers familiar with Can-Trace initiatives?

Result – Six of the seven companies said outright "no" or "not sure", while three of the seven companies said that the major retailers were familiar with Can-Trace initiatives.

Comments: The word "customer" implies the one down in the supply chain; in most cases, this represents retail or foodservice. This result may indicate that the CFTDS v 1.0 as such is not being used for supply chain traceability even though the generic data standards may be. Again, this may come down to a Can-Trace visibility issue for those supply chain members, which is something Can-Trace may wish to address.

Q3h. If you are an exporter, is your system capable of satisfying traceability?

Result – All seven companies indicate that they capable of satisfying export traceability requirements.

Comments: Even though only five of the seven companies surveyed actually export products (refer to question 1c), all companies have the capability to do so from a traceability standpoint. This implies that the data standards currently being used are rigorous enough to meet export requirements. Since the standards currently in use are indicative or compatible to the CFTDS v 1.0, this implies that the CFTDS v 1.0 is also rigorous enough to satisfy export requirements. The strong level of positive responses also indicates that these companies are aware of the traceability requirements for export and have designed their data collection standards to reflect these.

Section 4

(Traceability Data Processes) was designed to provide information on the companies' traceability systems, specifically data collection method, storage method and access to information.

Q4a. What information do you collect on incoming ingredients?

Result – Choices given were: Lot codes, dates, condition, certificates of analysis.
*   All seven companies said they collect all of this information
*   Four of the seven companies also collect "Best Before" dates

Comment: This question should refer to the "Generic Can-Trace Mandatory Data Requirements" for processors (p.16 of the CFTDS v 1.0) as described for "my production inputs". While not specifically referenced to the participants, it would appear as though the data requirements are being met.

Q4b. Where do you collect this information from?

Result – All seven companies collect information at receiving. Two of the seven specifically mentioned collection on the bill of lading.

Comments: While Can-Trace is not specific to the point of data collection (collection process) it would appear that all companies collect traceability data on inputs at receiving. Common method of collection (bill of lading) will therefore impact the data that is collected at receiving. The data collected at production input is what is commonly or easily collected on a bill of lading. The CFTDS v 1.0 recognizes this in the mandatory data element "Shipment Identifier".

Q4c. How do you collect this information?

Result – Choices given were: manually or electronically
- Four of the seven companies collect information both manually and electronically
- Two of the seven companies only collect information manually
- One of the seven companies only collects information electronically

Comments: Adoption of the CFTDS v 1.0 will ultimately come down to an issue of ease of collection, storage, access and distribution. Those companies that collect this information manually have either very small volumes of data to collect or are collecting limited data. For multi-ingredient companies with large numbers of input suppliers (refer to question 2c), a large amount of data would have to be collected. Based on these survey results and specifically the fact that companies of the size of those used in this survey are collecting data manually, Can-Trace may have an opportunity to "sell" the best practices implementation approach of the CFTDS V 1.0, which uses the GS1 System. Please see question Q5e.

Q4d. Where is the information stored?

Result – Choices given were: Electronically, hard (paper) copy or other
- Four of the seven companies store information in both forms
- Two of the seven companies only store this information on hard copy
- One of the seven companies only stores information electronically

Comments: Responses to this question are directly correlated to the responses to question Q4c; the companies that collect electronically, store electronically, etc. Comments for this question are similar as those for question Q4c; manual storage of data will not likely aid in the adoption of the CFTDS v 1.0. Again, Can Trace may want to consider replacing manual storage with CFTDS V 1.0 "best practices".

Q4e. Who has access to the information?

Result – Choices given were: Senior management, production personnel, quality assurance personnel, customers, auditors
- Three of the seven companies give access to everyone
- Two of the seven companies give access to everyone, except for customers
- One of the seven companies provides access to management, quality assurance personnel and production personnel, upon request
- One of the seven companies ties access to need and level of management

Comments: Access can imply requirements of the data beyond traceability, (eg. access for inventory control, access for productivity issues). Varied responses imply that access to the information is specific to a company's policy as opposed to a traceability standard of any kind. It would appear that there is no issue specific to Can-Trace data standards design and data access.

Q4f. How long do you keep the information on file?

Result – Responses varied; three years (five for organic products), 1.5 times the product's shelf life, two years, forever, 18 months, five years, three years.

Comments: Information retention time appears to be tied to either the product's shelf life (as related to recall protocols) or to the method of storage. There does not appear to be an issue regarding the implementation of the CFTDS V 1.0.

Section 5

Ingredient and product identification was designed to collect information on the specific methods of product identification and probe for issues on the companies traceability systems.

Q5a. Is there labeling consistency among your ingredient suppliers?

Result – Six of the seven companies said that they do not have consistent labeling. One of the seven companies stated that they do have labeling consistency because they provide their suppliers with the standard that must be used.

Comments: For uniform application of the CFTDS V 1.0, a method of uniform labeling would be advantageous. It should be noted that the question is meant to probe into labeling data consistency (type of information). This is an area of concern for Can-Trace since inconsistent labeling information translates to inconsistent adoption of the CFTDS V 1.0. The term "suppliers" relates to the one up in the supply chain or the same data requirements that apply to multi-ingredient companies. A mandatory imposition of the standards would conceivably eliminate these inconsistencies. The CFTDS v 1.0 does in fact address this issue in its "best practices" implementation, which uses GS1 standard bar code labels for product identification.

Q5b. Are your ingredients easily identified in storage?

Results – Six of the seven companies answered "yes" to this question. One of the seven companies stated that due to labeling inconsistencies at receiving, storage ID is problematic (although they are taking steps to remedy this)

Comments: This question relates to inventory control and the companies' ability to impose their data standards and traceability systems on ingredients after they have been received into storage. Of importance to Can-Trace is the fact that six of the seven companies have the ability to label ingredients in accordance to the CFTDS v 1.0 best practices (GS1 data standards), if required or desired.

Q5c. Are your ingredients easily identified during processing?

Results – Six of the seven companies indicated "yes" (one with reservations). One of the seven companies indicated that inconsistencies at receiving and storage translate to inconsistencies at processing (although lot codes are applied at processing)

Comments: This question is a continuation of question Q5b. The comments made in question Q5b also apply here.

Q5d. Are your ingredients easily identified in the finished product and/or during distribution?

Result – All seven companies answered "yes"

Comments: This question is of particular importance as it implies the ability of all seven companies to trace ingredients from processing to the shipment of the final product. This requires the development of final product lot codes, enabling

traceability back to individual ingredients. The ability to accomplish this is contained within the CFTDS v 1.0 required production input data standards and the required production output data standards (p.16 of the CFTDS V 1.0).

Q5e. Are you planning on making any significant changes to your traceability process?

Result – Choices given were: Yes or no.
- Two of the seven companies stated "no"
- One of the seven companies stated that they would like to but have no plans to do so
- Five of the seven companies stated "yes"

Comments: This question provides an indication of the potential number of multi-ingredient companies that are planning traceability system changes and the opportunity for Can-Trace to recommend that the CFTDS v 1.0 be used in those upgrades/changes. It also indicates that some companies view traceability as an evolving business practice, which is also an opportunity for Can-Trace. All companies that indicated that they would implement changes said that they will be doing so to increase efficiency and quality. This could be an opportunity for Can-Trace to identify how best practices implementation of the CFTDS v 1.0 could increase efficiency and quality.

Q5f. Without sharing company proprietary data or systems, would you be willing to share your traceability model?

Result – Two of seven companies said "no"
- One of the seven companies said that they have no model
- One of the seven companies said that it depends
- Three of the seven companies said "yes"

Comments: This question provides potential for Can-Trace to examine the specifics of the companies willing to share greater details about their systems, specifically the individual data elements that are collected and generated at each step of the production process.

Q5g. What areas do you feel allow for "breakdowns" in the traceability process?

Result – Choices given were: Suppliers, storage, processing, shipping, distribution, transport, customers
- One of the seven companies said "customers"
- Four of the seven companies said "suppliers"
- Three of the seven companies said "warehousing" (receiving, storing, retrieving)
- Two of the seven companies said "processing"

Comments: This question provides an indication of where companies feel weaknesses or vulnerabilities exist in the supply chain and the internal production process. The popularity of the "suppliers" response indicates that Can-Trace may wish to examine this point in the supply chain from a "best practices" perspective.

Section 6

was designed to identify how the participating companies feel that the CFTDS v 1.0 is applicable to their systems and those companies' ability to be fully compliant under the CFTDS v 1.0.

Q6a. Do your traceability data elements use the same terminology as the CFTDS v 1.0?

Result – All seven companies said "yes" (after reviewing the standards). Two of the seven companies said that they do not use specific data elements

Comments: This highly positive response indicates that the CFTDS v 1.0 is relevant and is - in the most part – already being used by industry. This may also be an indication that imposing the standard may not be a significant hardship on industry (both from an economic and logistical standpoint).

Q6b. Do your traceability data elements have the same function as the CFTDS v 1.0?

Result – All seven companies said "yes" (one said "assume so")

Comments: This is a positive indication that the CFTDS v 1.0 has been correctly designed and reflects industry's use and application for multi-ingredient processors of prepackaged products. There does not appear to be a need for Can-Trace to modify the data element functions for these types of processors.

Q6c. Are all your traceability data requirements included in the CFTDS v 1.0?

Result –   Three of the seven companies said "yes"
- Two of the seven companies said "not sure"
- One of the seven companies said "most are"
- One of the seven companies said "yes, plus more"

Comments: This question was asked in an attempt to discover if Can-Trace should add some data elements that are currently in use in multi-ingredient companies. It would appear that this is not a concern, as the majority of participants responded positively to this question. One company specifically stated that they add and use data elements that are mostly included in the CFTDS v 1.0 mandatory data requirements for primary producers, which implies that there can be a direct link from primary production to multi-ingredient companies. The standards should allow for this to happen, when required.

Q6d. What would be required in order for your company to implement the CFTDS v 1.0?

Result – Three of the seven companies said "nothing"
- One of the seven companies said "a greater understanding of the CFTDS v 1.0"
- One of the seven companies said that a better ingredient list would be required
- One of the seven companies said that there is no additional benefit
- One of the seven companies said that it would require consistency among suppliers

Comments: The responses indicate that implementation of the CFTDS v 1.0 wouldn't be considered a great hardship for most multi-ingredient companies. Better understanding of standards, better ingredient lists, and consistency among suppliers would be accomplished if the entire supply chain implemented the standard. Can-Trace may wish to develop and communicate these benefits to industry.

7. Discussion Of Survey Results:

The purpose of this section is to summarize the important facts that emerged from the surveys, relative to the issues and challenges that were intended to be addressed by the Multi-Ingredient White Paper. This section provides a discussion and recommendations regarding multi-ingredient processor implementation of the CFTDS v 1.0.

7(a). Issues and Challenges

Issue/Challenge	Survey Reference	Comment
1. Nature of Product	Q1.(b)	All respondents produce a pre-packaged product (issue related to data standard use)
2. Product Export	Q1.(c)	High percentage of companies (five out of seven) export their products (issue related to data standard use)
3. System Certification	Q1.(e)	All companies are using HACCP-based systems (issue related to data standard compatibility)
4. Ingredient Source	Q2.(b)	High percentage of ingredients sourced outside of Canada (challenge to ensure data standard compatibility)
5. Number Of Ingredient	Q2.(c)	Large number of ingredients per product (challenge to ensure data transfer and consistency)
6. System Standards	Q3.(b)	No uniform application of standards to develop traceability systems (challenge to present a consistent and repeatable data standard for traceability). No implementation of the CFTDS v 1.0.
7. Purpose of Program	Q3.(c)	All companies use traceability for product recalls (issue of ensuring that data standards are applicable to product recalls)
8. Supplier Data Collection	Q3.(e)	No uniform supplier validations (challenge of applying CFTDS v 1.0 in absence of supplier validation)
9. Familiarity with Can-Trace	Q3.(f)	Lack of knowledge about Can-Trace (challenge to increase Can-Trace's profile with multi-ingredient companies)
10. Data Collection	Q4.(b)	All companies collect information at receiving (issue is to ensure CFTDS v 1.0 stresses collection at this point)
11.Data Collection and Storage	Q4.(c)(d)	Majority of companies still collect and store data manually (challenge is to increase adoption of CFTDS v 1.0 given manual nature of collection and storage)
12. Product Identification	Q5.(a)	Six of the seven companies have an inconsistent labeling format from suppliers (issue is to have uniform application of CFTDS v 1.0 with inconsistent labeling formats)
13. Traceability "Breakdowns"	Q5.(g)	Four of the seven companies indicated that breakdowns in the traceability process occur with suppliers (issue is to focus on supplier data application of the CFTDS v 1.0)
14. System Changes	Q5(e)	Five of the seven companies are planning modifications to their traceability systems (challenge for Can-Trace to encourage use of the CFTDS v 1.0)
15. System Sharing	Q5(f)	Three of the seven companies expressed a willingness to share their systems (opportunity for Can-Trace to probe company data elements and collection protocols)
16. CFTDS v 1.0 Implementation	Q6.(d)	Varied responses on willingness to implement the CFTDS v 1.0 (issue is for Can-Trace to more effectively communicate the CFTDS v 1.0 to industry)

7(b). Summary

The 16 issues and challenges noted above can be summarized according to the following themes:

1. The nature of multi-ingredient companies; their products and ingredients
2. Traceability systems and standards
3. Ingredient identification and handling
4. Can-Trace's profile with multi-ingredient companies

1. The Nature Of Multi-Ingredient Companies; Their Products And Ingredients.

The survey results indicated a solid emphasis of participating companies on export markets. This is not surprising given Canada's high reliance on exports for a significant portion of its manufactured and raw commodity products (40% of Canadian Gross Domestic Product (GDP) is derived from exports, Source: Statistics Canada 2005). Therefore, any data standards designed for use by Canadian companies must have international applications and must ensure that data collection and labeling (transfer) are seamless and internationally recognizable.

There was also a strong emphasis on the importation of raw materials by multi-ingredient companies from foreign sources. This implies that the one-down traceability model will involve the receiving and processing of traceability information from countries other than Canada. Again, the importance being able to apply standards internationally cannot be understated.

It is clearly stated on page 10 of the CFTDS v 1.0 that the standards' development was based on "global standards (GS1 and ISO)". This applicability to compliance with international standards and regulations should be emphasized.

The companies produce a wide range of pre-packaged products for both the retail and foodservice industries. They also use a large number of ingredients per product. It is also significant to note that all surveyed companies used HACCP-based systems and that the primary purpose of their traceability programs was to facilitate product recalls.

2. Traceability Systems And Standards.

The survey provided interesting insights that are applicable to Can-Trace's goals with respect to traceability system designs and uses. It was clear from the survey's responses that no two companies surveyed used the same set of data standards when designing their traceability systems. While this outcome was discouraging initially, it became apparent that despite the uniform application of standards, the resulting systems did in fact use many of the eight mandatory data elements contained in the CFTDS v 1.0. This is a clear indication that the data elements identified by Can-Trace in the CFTDS v 1.0 were correct and identical to what had previously been identified and used by industry. In fact, the survey results for Section 6 showed that there were no significant data gaps between Can-Trace's recommendations and what was currently being done by industry. There were a couple of exceptions; one company did not use a shipment identifier (an exception as opposed to an addition), and one company used a BBD (Best Before Date), a date of production and an expiration date. It should be noted here that the CFTDS v 1.0 recognizes that these dates can be used to provide the traceability function of the Lot Number, which is used to identify units of a product or ingredient that share the same production attributes from a food safety and food quality perspective.

The issue of system design and the lack of design consistency is an opportunity for Can-Trace to demonstrate that implementing its "best practices" recommendations, which use the GS1 data standard, can provide a solution to system compatibility and data transfer issues.

3. Ingredient Identification And Handling.

Concern surrounding product receiving was consistent among survey respondents. Specifically, all companies surveyed collect data at product receiving, four of the seven companies surveyed identified receiving as the point in the supply chain where traceability breakdowns occur, six of the seven companies indicated that the labeling formats used by suppliers were inconsistent, two of the seven had no requirements or systems for supplier validation, and the remaining five companies only perform supplier validations on certain ingredients and without consistent standards.

These results point to an area of potential importance for Can-Trace. There appears to be an opportunity to emphasize the implementation of the CFTDS v 1.0 using the GS1 data standards as a method of implementing supplier validations (specific to data collection, storage and sharing protocols).

Barring this, Can-Trace should recognize the importance of the first link in the supply chain. If data is not collected correctly (to the CFTDS v 1.0) at this stage, there is little chance for data consistency throughout the supply chain without significant effort on the part of other supply chain members. This fact should be understood and emphasis should be placed on data collection, storage and sharing at the primary producer stage of the supply chain. It should be noted that in the context of this survey, "labeling inconsistency" relates to the data contained on the product labels, not the design, size and location of the labels.

4. Can-Trace's Profile With Multi-Ingredient Companies.

There is also a common theme relating to industry knowledge of Can-Trace, its mission and the CFTDS v 1.0 document.

The survey participants were companies with some level of previous exposure to Can-Trace, either through the national consultation meetings conducted in the summer of 2005 or through the Can-Trace Multi-Ingredient Working Group. Given this previous exposure, there was an expectation that all companies would have a strong understanding of Can-Trace and its mission. In fact, three of the seven companies indicated that they were not familiar with Can-Trace, while four of seven companies were. This points partially to company compartmentalization (attendees of workshops are not necessarily the survey respondents and do not necessarily share in the workshop results), but also provides an opportunity for Can-Trace to increase its profile to multi-ingredient companies. Can-Trace should be encouraged by the industry's willingness to consider implementation of the CFTDS v 1.0 document. If provided with better information of the standards themselves and the benefits of using them, and if the standards were consistently applied to suppliers, virtually all companies surveyed could or would consider implementing the CFTDS v 1.0.

There is also an opportunity for Can-Trace to explore company traceability systems in greater detail. This would enable Can-Trace to test the application of the data standards at a more detailed level than allowed by a survey. Two issues relate directly to this opportunity; first, five of the seven companies intend on making significant changes to their traceability systems, and second, three of the seven companies are willing to share their traceability processes with Can-Trace. All three are included in the group that will be upgrading their systems.

Can-Trace could achieve greater visibility through increased communication to all supply chain stakeholders and concentrated communication to retail supply chain members (as well a reliance on trickle-down knowledge to other supply chain members).

8. Conclusions and Recommendations

According to the consultants, survey results indicate that:

a) The surveyed companies represent a sound cross-section of multi-ingredient processors relative to the issues and challenges assessed. It is significant to note that all companies surveyed use HACCP-based systems and that the primary purpose of their traceability systems is to facilitate product recalls. Most of the companies surveyed import ingredients and export products internationally. The consultants concluded that the survey results represent the issues and challenges faced by a broad range of multi-ingredient processors in Canada.

b) While none of the companies have implemented the CFTDS v 1.0, the traceability data which they collect, share and keep is virtually identical to the mandatory data elements recommended in the CFTDS V 1.0. Based on these results, the consultants concluded that the CFTDS v 1.0 does not need to be modified to accommodate multi-ingredient products.

c) Breakdowns in the traceability process occur most frequently with suppliers and are primarily due to the inconsistent, non-standard use of labeling formats to identify ingredients. Unlike single-ingredient processors, their multi-ingredient counterparts must deal with the complexity of having to track and trace large numbers of ingredients for each product produced. A high percentage of ingredients are imported and a high percentage of products are exported. The majority of companies still collect and store traceability data manually. Based on these results, the consultants concluded that multi-ingredient processors would benefit from implementing the CFTDS v 1.0 using its "best practices". The "best practices" recommend the use of the international GS1 data standards for ingredient and product identification, using standard bar codes to collect data electronically. A GS1 data standard implementation of the CFTDS v 1.0 would also facilitate the synchronization of data between suppliers, processors and customers, and would simplify supplier validations.

d) None of the companies have implemented the CFTDS v 1.0. No two companies used the same data standard to implement their traceability systems. The majority of companies are planning on modifying their traceability systems. Almost half of the companies surveyed are willing to share their traceability systems with Can-Trace. Based on these results, the consultants concluded that an opportunity exists for Can-Trace to sell the benefits of implementing the CFTDS v 1.0 using the international GS1 data standards to multi-ingredient processors in Canada. The consultants recommend that Can-Trace conduct a more detailed study with the companies willing to share their traceability systems in order to demonstrate the benefits of an implementation of the CFTDS v 1.0. The deliverable of this study could be a "How to Guide", which can be used by Can-Trace to encourage multi-ingredient processors to implement the standard.

Appendix A. Summary of the Canadian Food Traceability Data Standard, Version 1.0

Important Definitions

What is traceability?
Can-Trace uses the ISO definition of traceability.

Traceability is the ability to trace the history, application or location of that which is under consideration.

For additional clarity, Can-Trace further defines traceability as being made up of two components: tracking and tracing.

What is tracking?
Tracking is the capability to follow the path of a specified unit and/or lot of trade items downstream through the supply chain as it moves between trading partners. Trade items are tracked routinely for availability, inventory management and logistical purposes. In the context of this standard, the focus is on tracking items from the point of origin to the point of sale.

What is tracing?
Tracing is the capability to identify the origin of a particular unit located within the supply chain by reference to records held upstream in the supply chain. Units are traced for purposes such as product recalls and complaints.

Each partner in the supply chain needs to keep or share the mandatory elements and – depending on requirements of their sector – may need to keep and share some optional elements as well.

Basic elements of traceability
Product, party and location identification

Fundamental to tracking and tracing a product for full supply chain traceability, every food component harvested from farm or sea must be tracked at every stage of its transformation to a finished product. Furthermore, these identifiers must be uniquely identified at each stage of transformation process.

Assigning identifiers to a product, relating them to their predecessor, recording them and sharing them with supply chain partners is the essence of traceability. As products move or are transformed by different supply chain participants at different locations, new product, party and location identifiers are assigned and linked to their predecessors.

There are many ways to assign, record and store identifiers. The CFTDS v 1.0 provides for the use of GS1 international standards for product, party and location identification. This standard applies to all activities from farm or sea to retail or foodservice establishments.

It is recognized that there are existing investments in individual animal, group, herd or flock identification systems such as the Canadian Cattle Identification Agency. These animal identifiers can be linked to the GS1 identifiers in the rest of the supply chain.

Linking of information

To ensure the continuity of the flow of traceability information, each partner must pass on information about the identified lot or product group to the next partner in the production chain.

It is imperative that the links between the lots and the logistical units (resulting from a product transformation) are recorded. Within a company, the control of all these links and accurate recordkeeping make it possible to connect what has been received and what has been produced and/or shipped.

If one of the stakeholders in the production chain fails to manage these links, it will result in a loss of traceability.

Recording of information

Effective traceability requires standardization of information that needs to be recorded through each step of the food production and distribution chain.

The end result is standardized data representing all the information necessary to collect, keep and share data, allowing for effective tracking and tracing. The CFTDS v.1 represents generic information common to all commodities.

The CFTDS v.1 defines the data requirements; it does not define how this standard should be implemented.

Canadian Food Traceability Data Standard, Version 1.0

Data Types:

There are two types of data required for traceability: Master and Transactional data.

Master data is information that seldom changes. Master data applies to product, party and location information. It includes information such as product description, buyer identifier, location, etc.

Transactional data is data that is unique to each individual transaction. Examples include Lot Number, Shipment Identifier and Shipment Date.

Data Usage:

As the name implies, mandatory data refers to the information that all supply chain partners are obliged to collect, keep, and share. Optional data are additional pieces of information that are useful but not essential.

Mandatory Data Elements:

No	Data Attribute Name	Data Attribute Definition
3	Buyer Identifier	A number or code that uniquely represents the party purchasing the product.
9	Lot Number	A number or code assigned to uniquely represent a batch or group of inputs, products, and/or outputs. The number is generally assigned by the company or individual creating the goods.
10	Product Description	A description of the product in a non pre-defined format.
11	Product Identifier	A number or code that uniquely represents a commercial trade item. For farm products: The product identifier uniquely distinguishes individual units of production (eg. animal, bin, catch, flock). For processed or finished goods: The product identifier represents a seller's retail trade item (product); or non-retail trade item (case or master carton).
12	Quantity	Count, net weight, or net volume of a product (trade item).
17	Shipment Identifier	A number or code that uniquely distinguishes a shipment of products. May be linked to a lot number.
20	Unit of Measure	Description of the units in which a quantity is being expressed. Note: Where this measure is used to describe weight, volume or count, a "net" value is applied. The term "net" is taken to mean the product exclusive of its container or packaging.
23	Vendor/Supplier Identifier	A number or code that uniquely represents the party selling the product.

No	Data Attribute Name	Data Attribute Definition
1	Animal Age	The birth date of the animal.
2	Best Before Date	The date before which the product is at its freshest.
4	Buyer Name	The name of the party purchasing the product
5	Contact Information	The company contact information
6	Country of Origin, Province or State	The country in which the goods have been packed, processed, or manufactured. Where required, includes Province or State.
7	Date of Pack/Catch/Retirement	The date that the product was packed; in the case of fish, the date caught; or in the case of livestock with an identification tag, the retirement (or slaughter) date on the tag.
8	Logistics Provider Identifier	A number or code that uniquely represents a transporter, carrier, or other third party logistics provider.
13	Receipt Date	Date that the shipment is received at its destination.
14	Ship Date	The date that goods were sent.
15	"Ship From" Location Identifier	A number or code that uniquely identifies the origin of the shipment. This location may be a premise, or a specific company location such as a manufacturing plant.
16	"Ship To" Location Identifier	A number or code that represents the destination of a shipment, which may be a premise or a specific company location
18	Shipping Container Serial Number	A seller-assigned number that uniquely represents a logistic unit (eg. case or pallet).
19	Supplier License Number	Commercial license issued to a fishing boat or vessel.
21	Unit of Trade	The logistic unit of weight of the product. This is the net weight.
22	Vehicle Identifier	A number or code that uniquely represents a vehicle or a vessel transporting goods.
24	Vendor/Supplier Name	The name of the party selling the goods.

No	Data Attribute Name	Traceability Function	Basic Element of Traceability
1	Animal Age	A food safety/food quality attribute (used for BSE).	
2	Best Before Date	A food safety/food quality attribute sometimes used as the lot number to identify a product in the event of a product recall or food safety issue.	Product
3	Buyer Identifier	Used to identify the responsible party (owner and/or receiver) to contact in the event of a product recall, food safety or animal health issue.	Party/Location
4	Buyer Name	Used to identify the responsible party (owner and/or receiver) to contact in the event of a product recall, food safety or animal health issue.	Party
5	Contact Information	Name of the individual(s) to contact in the event of a product recall, food safety or animal health issue and their co-ordinates.	Party
6	Country of Origin, Province or State	Used for market access where the country of origin is a regulatory issue.	
7	Date of Pack/Catch/Retirement	A food safety/food quality attribute, which is sometimes used as the lot number to identify a product in the event of a product recall or food safety issue.	Product
8	Logistics Provider Identifier	Used to identify the responsible party who handles the goods on behalf of the buyer, seller or both. Generally the sender, receiver or transporter.	Party/Location
9	Lot Number	A unique ID which appears on boxes or labels and is used to track and locate a product in the event of a product recall or food safety issue.	Product
10	Product Description	Used for product identification as a marking on the box or label. May also be used on pallet labels.	Product
11	Product Identifier	Used for product identification on the box or label. May also be used for product identification on a pallet label. For livestock producers, the product identifier can be the Canadian Livestock Identification Agency animal identification number. For packaged goods, can be the product's GTIN	Product

No	Data Attribute Name	Traceability Function	Basic Element of Traceability
12	Quantity	Used to verify that all affected products can be accounted for in the event of a product recall or food safety issue.	Product
13	Receipt Date	May be used to find the existing location of a product during a product recall or food safety issue.	Location
14	Ship Date	May be used to find the existing location of a product during a product recall or food safety issue.	Location
15	"Ship From" Location Identifier	Used to identify the premise or location that a product is shipped from in order to establish movement history and product location in the event of a product recall, food safety or animal health issue.	Location
		For livestock producers, it can be the premise ID. In the GS1 System, it can be the GLN.	
16	"Ship To" Location Identifier	Used to identify the premise or location that a product is shipped to in order to establish movement history and product location in the event of a product recall, food safety or animal health issue. For livestock producers, it can be the premise ID. In the GS1 System, it can be the GLN (Global Location Number).	Location
17	Shipment Identifier	Used to establish product movement between links in the supply chain, identify the responsible party (ownership, sender, transporter, receiver) and the contact in the event of a product recall, food safety or animal health issue, and to determine the existing location of a product or animal.	Party/Location
18	Shipping Container Serial Number	GS1 Serial Shipping Container Codes (SSCC) - Used to identify unique pallets of products shipped between trading partners.	Product
19	Supplier License Number	Used to identify the vehicle of conveyance, the location of a product during transit and the responsible party, in the event of a product recall or food safety issue.	Party/Location
20	Unit of Measure	Used to verify that all affected products can be accounted for in the event of a product recall or food safety issue.	Product

No	Data Attribute Name	Traceability Function	Basic Element of Traceability
21	Unit of Trade	Used for product identification as a marking on the box or label and/or to verify that all affected products can be accounted for in the event of a product recall or food safety issue.	Product
22	Vehicle Identifier	Used to identify the vehicle of conveyance, the location of a product during transit and the responsible party, in the event of a product recall, food safety or animal health issue.	Party/Location
23	Vendor/Supplier Identifier	Used to identify the responsible party (owner and/or sender) to contact in the event of a product recall, food safety or animal health issue.	Party
24	Vendor/Supplier Name	Used to identify the responsible party (owner and/or sender) to contact in the event of a product recall, food safety or animal health issue.	Party