Catalogue no. 18-001-X
ISSN 0000-0000
ISBN 978-1-100-22671-2

Working paper

Reports on Special Business Projects

Results from the 2011 Functional Foods and Natural Health Products Survey

by Beau Khamphoune

Centre for special business projects

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Centre for special business projects

Results from the 2011 Functional Foods and Natural Health Products Survey

Published by authority of the Minister responsible for Statistics Canada

September 2013

Catalogue no. 18-001-X

ISSN 0000-0000
ISBN 978-1-100-22671-2

Frequency: Irregular

Ottawa

Cette publication est également disponible en français.

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Symbols

The following standard symbols are used in Statistics Canada publications:

.	not available for any reference period
..	not available for a specific reference period
...	not applicable
0	true zero or a value rounded to zero
0^s	value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
^{p}	preliminary
^{r}	revised
x	suppressed to meet the confidentiality requirements of the *Statistics Act*
^{E}	use with caution
F	too unreliable to be published
*	significantly different from reference category (p < 0.05)

Note to users

The data presented in this paper comes from a cost recovery survey, sponsored by Agriculture and AgriFood Canada. The survey supported many tabulations specified by the client department.

While this paper presents data at the Canada level, the survey was designed to present data by region. This detail is available in summary tables which are available on a cost recovery basis upon request.

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Acknowledgements

For their help and constructive suggestions, the author would like to thank Eric Turgeon, Jennifer Winters and Frances Anderson from Statistics Canada, as well as Deepananda Herath, Margaret Zafiriou, Ashwina Aubeeluck and Sara Sarkar from Agriculture and Agri-Food Canada.

Highlights

- All results contained in this paper represent Canada level data.
- In 2011, 750 establishments were involved in activities related to functional foods and natural health products (FFNHP). Of these, 117 establishments produced or developed functional food products, 422 establishments produced or developed natural health product products, 144 establishments produced products in both fields and 66 establishments provided services only to either field. In addition to FFNHP products, many of these establishments were involved in the production and development of other conventional or processed food and chemical products and services.
- Total revenue from all sources for all establishments in 2011 was $16.4 billion of which $11.3 billion (69%) came from FFNHP related activities.
- Of the total FFNHP revenue, 40% came from establishments producing functional foods, 29% from establishments producing natural health products, 29% from establishments producing both and 2% from service-only establishments.
- Export revenue from all establishments amounted to $2.3 billion of which $1.7 billion (74%) was generated from exports of FFNHP products.
- The majority of exports originated from natural health products ($1.3 billion). The most common destination for exports was the United States.
- A total of 37,253 individuals were employed by all establishments, of which 44% had FFNHP related duties.
- 90 FFNHP establishments indicated that they had unfilled positions for FFNHP employees.
- Total research and development (R&D) expenditures from all establishments in 2011 amounted to $320 million of which $238 million (74%) was related to FFNHP activity.
- There were 110 establishments which attempted to raise capital for FFNHP purposes in 2011. Of these, 58 were successful, raising a total of $42 million.
- The distribution channel direct to retailers, generated the highest proportion of FFNHP sales (37%) followed by direct selling (14%).
- 181 FFNHP establishments developed trade secrets, 175 FFNHP establishments registered trademarks, and 94 held patents.
- Establishments indicated that there were 32,266 FFNHP product lines on the market. Natural health products alone accounted for 85% of these product lines.

Overview of the functional food and natural health product (FFNHP) sector, by sub-sector, 2011

	Functional [1] food establishments	Natural [2] health product establishments	Establishments [3] active in both fields	Service only establishments	Total
	number				
Total number of FFNHP establishments	**117**	**422**	**144**	**66**	**750**
Total FFNHP employment	**4,713**	**6,185**	**4,718**	**643**	**16,259**
	thousands of dollars				
Total FFNHP revenue	**4,453,928**	**3,281,776**	**3,313,073**	**215,893**	**11,264,670**
Total FFNHP exports	**269,062**	**735,421**	**685,723**	**...**	**1,690,206**
Total FFNHP research and development	**18,345**	**98,130**	**107,563**	**14,056**	**238,094**

1. Functional Food establishments: Includes Functional Food establishments with or without a service-providing component.
2. Natural Health Product establishments: Includes Natural Health Product establishments with or without a service-providing component.
3. Functional Food and Natural Health Product establishments: Includes establishments involved in Functional Food and Natural Health Products with or without a service-providing component.

Note(s): Totals may not add up due to rounding.
Source(s): Statistics Canada, The Functional Foods and Natural Health Products Survey, 2011.

Results from the 2011 Functional Foods and Natural Health Products Survey

by Beau Khamphoune

1 What are functional foods and natural health products?

The 2011 Functional Foods and Natural Health Products (FFNHP) survey was conducted to collect information on establishments in Canada that develop and manufacture innovative functional foods and natural health products, as well as establishments that offer expertise and services such as specialized encapsulation, contract manufacturing of private label products and other packaging technologies.

Currently, there is no universally accepted definition for functional food and natural health products. Definitions vary across countries and evolve over time reflecting the perspectives of different regulatory bodies, advances in scientific knowledge and changing market demand for products. The definitions used in the 2011 Functional Foods and Natural Health Products (FFNHP) survey were developed by Health Canada, one of two federal regulators of these products.

Functional foods are similar in appearance to, or may be, a conventional food, consumed as part of a usual diet, which is demonstrated to have physiological benefits or to reduce the risk of chronic disease beyond basic nutritional functions.[1]

For the purpose of the survey, the definition of functional food is specific to products that have been actively enhanced with bioactive ingredients during production. Examples of such products include milk, meat and eggs with increased levels of omega-3 fatty acids, yogurts with probiotics and fruit juice with calcium.

"Bioactive" is a substance that is demonstrated or purported to have a favourable effect on health. In the context of food, bioactives include nutrients (e.g. vitamins and mineral nutrients) and non-nutrients (e.g. lycopene, live microbes) that may be inherent in or added to food.[2]

Natural health products are products made from natural sources, sold in dosage form and are designed to maintain or promote health; to restore or correct human health function; or to diagnose, treat or prevent disease. Examples include vitamins and minerals, herbal remedies, homeopathic medicines, traditional medicines such as Chinese medicine, probiotics, and other products like amino acids and essential fatty acids.[3]

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1. Health Products Regulations SOR/2003-196, under the *Food and Drugs Act*, R.S.C. c. F-27 as amended.
2. Health Canada (2009). Health Canada Guidance Documents for Preparing a Submission for Food Health Claims, Bureau of Nutritional Sciences, Food Directorate, Health Products and Food Branch, Health Canada, Ottawa, March, 2009 (available at: *http://www.hc-sc.gc.ca/fn-an/legislation/guide-ld/health-claims_guidance-orientation_allegations-sante-eng.php#a1-6*, accessed July 19, 2013)
3. Health Canada (2003). Overview of the Natural Health Products Regulations Guidance Document, Natural Health Product Directorate, Health Canada, Ottawa, November, 2003 (available at: *http://www.hc-sc.gc.ca/dhp-mps/alt_formats/hpfb-dgpsa/pdf/prodnatur/regula-regle_over-apercu-eng.pdf*, accessed July 19, 2013)

2 Number and types of establishments

The 2011 Functional Food and Natural Health Products (FFNHP) survey identified 750 establishments engaged in one or some combination of functional food (FF) or natural health product (NHP) production, development or service activities (Table 1). These establishments were classified into seven distinct groups:

1. establishments that develop or produce functional food (FF) products only;
2. establishments that develop or produce natural health product (NHP) products only;
3. establishments that only provide services related to FFNHP products;
4. establishments that develop or produce both FF and NHP products;
5. establishments that develop or produce and provide services related to FF products only;
6. establishments that develop or produce and provide services related to NHP products only;
7. establishments that develop or produce and provide services related to both FF and NHP products.

In 2011, almost a third of the establishments developed or produced NHP products only. One in ten focused on the development or production of FF products only.

Table 1
Functional food and natural health product establishments by sub-sector, 2011

	(1) Functional food only establishments	(2) Natural health product only establishments	(3) Service only establishments	(4) Functional food and natural health product establishments	(5) Functional food and Service establishments	(6) Natural health product and Service establishments	(7) Functional food, Natural health product and Service establishments	All establishments
	number							
Total establishments	**86**	**236**	**66**	**60**	**31**	**186**	**84**	**750**

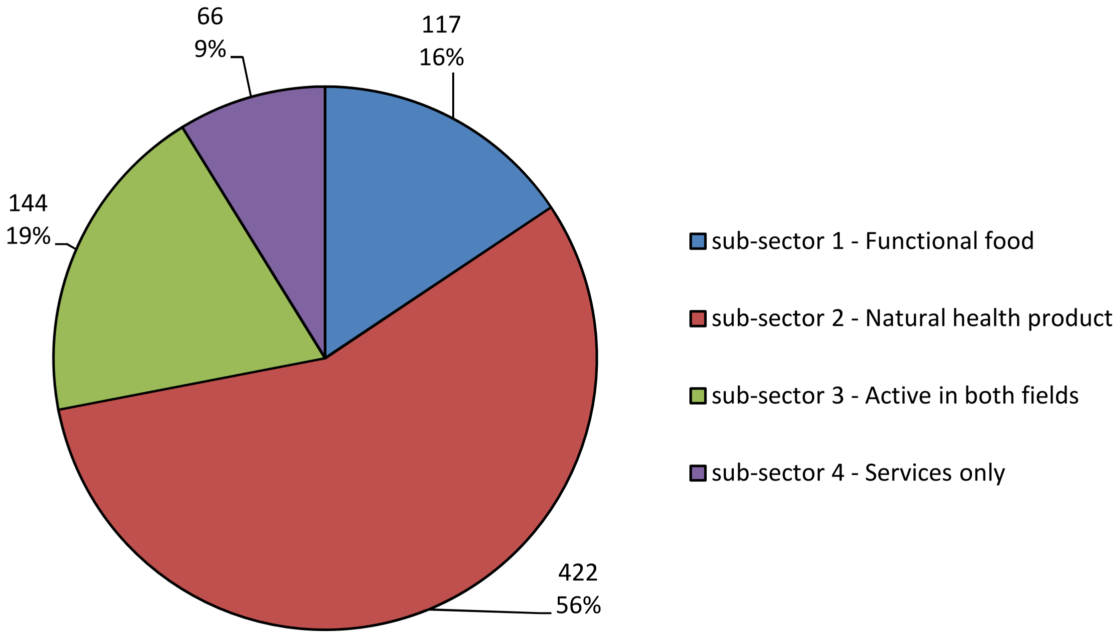
Note(s): Totals may not add up due to rounding.
Source(s): Statistics Canada, The Functional Foods and Natural Health Products Survey, 2011.

For the remainder of this report the seven establishment groups were collapsed into 4 sub-sectors:

- **Functional Food Establishments** which included those in groups 1 and 5;
- **Natural Health Products Establishments** which included those in groups 2 and 6;
- **Establishments Active In Both Fields** which included those in groups 4 and 7; and
- **Service Only Establishments** which were those in group 3.

Three quarters (566) of the FFNHP population were engaged in some type of production, development or service related to a natural health product in 2011 (Chart 1).

Chart 1
Establishments by sub-sector, 2011



Note: Totals may not add up due to rounding.

Source: Statistics Canada, The Functional Foods and Natural Health Products Survey 2011.

3 Types of products

Counts of establishments that directly or indirectly developed or produced FFNHP products by type of product are presented in Table 2. These establishments may have reported more than one product type. The largest share of FF establishments reported that they were involved in the development of foods and beverages that had added active ingredients, excluding vitamins or minerals. Examples of these products include margarine with phytosterols, drinks with herb blends, and foods with added soluble fibre and yogurts with probiotics. Each of the five specified NHP products was produced by more than half of the establishments producing NHPs.

Table 2
Establishments by sub-sector and product, 2011

	Functional [1] food establishments	Natural [2] health product establishments	Establishments [3] active in both fields	Service only establishments	All establishments
	number				
Foods and beverages that are fortified with vitamins and/or minerals beyond mandatory requirements for the purpose of providing added health benefits.	62	…	97	…	159
Foods and beverages that have added active ingredients, excluding vitamins or minerals	82	…	108	…	190
Foods and beverages specially enhanced to contain more of a functional component	38	…	39	…	77
Other functional food	x	…	x	…	7 E
Natural health products extracted or purified from plants	…	225	106	…	331
Natural health products ground, dried, powdered and processed from plant materials	…	235	92	…	327
Natural health products produced, extracted or purified from animal or micro organisms	…	200	71	…	272
Natural health products produced, extracted or purified from marine sources	…	204	73	…	276
Natural health products comprised solely of vitamins and minerals	…	191	61	…	252
Other natural health product	…	x	x	…	27

1. Functional Food establishments: Includes Functional Food establishments with or without a service-providing component.
2. Natural Health Product establishments: Includes Natural Health Product establishments with or without a service-providing component.
3. Functional Food and Natural Health Product establishments: Includes establishments involved in Functional Food and Natural Health Products with or without a service-providing component.

Note(s): Totals may not add up due to rounding.
Source(s): Statistics Canada, The Functional Foods and Natural Health Products Survey, 2011.

4 Business structure

Most establishments operating in FFNHP activities (88%) reported that they were private corporations (Table 3). Almost all of them (98%) had a head office located in Canada and only 15% indicated that they were part of a multinational enterprise.

Table 3
Business structure of FFNHP establishments by sub-sector, 2011

	Functional [1] food establishments	Natural [2] health product establishments	Establishments [3] active in both fields	Service only establishments	All establishments
	number				
Business structure					
Private corporation	95	387	121	58	660
Publicly traded corporation	x	9	12	x	38
Sole proprietorship	0	x	x	x	19
Unincorporated partnership	x	x	0	0	x
Cooperative	10	6 E	7	0	23
Other	0	x	x	0	x
Establishments with head offices located in Canada	108	419	140	65	732
Establishments who are a subsidiary of a multi-national enterprise	41	50	x	x	109

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Note(s): Totals may not add up due to rounding.
Source(s): Statistics Canada, The Functional Foods and Natural Health Products Survey, 2011.

5 Revenue

In 2011, FFNHP establishments reported total annual revenue of $16.4 billion from all sources (Table 4). FFNHP activities accounted for 69% of total revenue. Other activities such as conventional food processing and manufacturing, scientific research development or chemical and pharmaceutical wholesale distribution generated the remaining $5.1 billion in revenue.

Functional food establishments generated 40% of FFNHP revenue in 2011. Natural health product establishments and those active in both fields each contributed 29% of FFNHP revenue. The remaining 2% of revenue came from service only establishments.

Of the total revenue generated by functional food establishments ($7.7 billion), 58% was from functional food related activities. In contrast, 85% of the $3.9 billion in revenue earned by natural health product establishments was related to natural health product activities.

Establishments that were active in both FF and NHP fields reported 46% of revenue from functional foods and 54% from natural health products. Service-only establishments reported almost 17 times more revenue from NHP activities compared with FF activities.

Table 4
Revenue for functional food and natural health product establishments by sub-sector, 2011

	Functional [1] food establishments	Natural [2] health product establishments	Establishments [3] active in both fields	Service only establishments	All establishments
	thousands of dollars				
Total establishment revenues (all sources)	**7,735,118**	**3,858,791**	**4,496,778**	**266,517**	**16,357,203**
From functional food and natural health products	4,453,928	3,281,776	3,313,073	215,893	11,264,670
From functional food products	4,453,928	...	1,536,034	12,069	6,002,031
From natural health product products	...	3,281,776	1,777,039	203,824	5,262,639

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3. Functional Food and Natural Health Product establishments: Includes establishments involved in Functional Food and Natural Health Products with or without a service-providing component.

Note(s): Totals may not add up due to rounding.
Source(s): Statistics Canada, The Functional Foods and Natural Health Products Survey, 2011.

6 Establishment activities

The largest share of FFNHP establishments reported that they were involved in the wholesale of products (57%), product development or scale up of new products (57%) and scientific research and development (53%) in 2011 (Table 5). NHP establishments reported the same top three activities as all FFNHP establishments. For FF establishments, the top reported activities were manufacturing consumer ready products (75%) followed by product development (64%) and scientific research and development (54%).

Table 5
Functional food and natural health product establishments by type of activity and sub-sector, 2011

	Functional food establishments [1]	Natural health product establishments [2]	Establishments active in both fields [3]	All establishments
	number			
Scientific research and development (R&D)	63	222	109	394
Product development or scale up of new products	75	234	116	425
Extraction of bioactives or medicinal ingredients	x	42	x	68
Manufacturer of ingredients or raw materials to be used in functional foods or natural health products	17	78	45	140
Manufacturer of semi-finished functional foods and/or natural health products to be further processed before sales	11	73	32	115
Manufacturer of consumer-ready products to be sold without further processing	88	180	72	340
Wholesaler of products	55	293	82	429
Retailer of products	24	133	45	202
Other	x	16	x	23

1. Functional Food establishments: Includes Functional Food establishments with or without a service-providing component.
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3. Functional Food and Natural Health Product establishments: Includes establishments involved in Functional Food and Natural Health Products with or without a service-providing component.

Note(s): Totals may not add up due to rounding.
Source(s): Statistics Canada, The Functional Foods and Natural Health Products Survey, 2011.

7 Exports

In 2011, establishments reported total FFNHP related exports of $1.7 billion (Table 6), which was 74% of total exports from all sources and 15% of total FFNHP revenue. Most FFNHP export revenue was generated by NHP establishments (44%) and establishments active in both fields (41%).

Exports of natural health products accounted for 79% of the total FFNHP export value and dominated exports of both NHP establishments and those active in both fields. Functional food exports accounted for the remaining 21% of total FFNHP export revenue. Sales to the USA accounted for more than half of the export revenue generated from functional food products. While half of the revenue from natural health product exports came from the USA, other notable destinations for exports included the European Union and China.

Table 6
Functional foods and natural health products export revenues by destination and sub-sector, 2011

	Functional food establishments [1]	Natural health product establishments [2]	Establishments active in both fields [3]	All establishments
	thousands of dollars			
Total export revenues (all sources)	**507,135**	**780,556**	**983,258**	**2,270,950**
Functional food products and natural health products exports	269,062 E	735,421	685,723 E	1,690,206
Functional Food products	269,062 E	...	84,047 E	353,109 E
To United States	x	...	x	194,499 E
To the European Union [4]	x	...	0	x
To Japan	x	...	0	x
To China	x	...	F	x
To other countries	x	...	x	x
Natural Health Products	...	735,421	601,676	1,337,097
To United States	...	487,122	186,777 E	673,899
To the European Union [4]	...	x	x	280,700
To Japan	...	x	x	78,476 E
To China	...	x	x	175,504 E
To other countries	...	74,573	53,945	128,518

1. Functional Food establishments: Includes Functional Food establishments with or without a service-providing component.
2. Natural Health Product establishments: Includes Natural Health Product establishments with or without a service-providing component.
3. Functional Food and Natural Health Product establishments: Includes establishments involved in Functional Food and Natural Health Products with or without a service-providing component.
4. Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Republic of (EIRE), Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and, United Kingdom.

Note(s): Totals may not add up due to rounding.
Source(s): Statistics Canada, The Functional Foods and Natural Health Products Survey, 2011.

8 Imports

Total imports by all establishments active in FFNHP were $670 million (Table 7). Half of these imports were for FFNHP products. The USA was the main source of imported products for all FFNHP establishments, accounting for two-thirds of imports of NHP products and 99% of FF product imports.

Table 7
Functional food and natural health product imports by product and source, 2011

	All establishments
	thousands of dollars
Total cost of imports (all sources)	**670,260**
Total functional food products and natural health products imports	336,688
Functional food products	33,356
From the USA	32,939
From the European Union [1]	x
From Japan	0
From China	243
From other countries	x
Natural health products	303,332
From the USA	200,131
From the European Union [1]	83,243 E
From Japan	x
From China	14,838
From other countries	x

1. Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Republic of (EIRE), Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and, United Kingdom.

Note(s): Totals may not add up due to rounding.
Source(s): Statistics Canada, The Functional Foods and Natural Health Products Survey, 2011.

9 Employment

FFNHP establishments employed 16,259 individuals to perform FFNHP related duties in 2011 (Table 8). This group accounted for 44% of all individuals employed by establishments in the FFNHP sector. FFNHP employees included those hired on a permanent, seasonal, casual and contract basis so long as they devoted all or any portion of their time to FFNHP related activities or to tasks associated with the running of the FFNHP portion of the business. Of total FFNHP related employees, 38% were working in NHP establishments and 29% in each of FF establishments and establishment's active in both fields. The remaining 4% were employed by service-only establishments.

Almost two-thirds of the employees working in natural health product establishments engaged in some form of FFNHP related activity while only 26% of employees in functional food establishments had FFNHP related duties. The larger share of FFNHP related employees in NHP establishments reflects the fact that these establishments are specialised in NHP activities. About 40% of the employees in service-only establishments worked on FFNHP related activities.

Table 8
Employment by sub-sector, 2011

	Functional food establishments [1]	Natural health product establishments [2]	Establishments active in both fields [3]	Service only establishments	All establishments
	number				
Total employment	**17,874**	**9,492**	**8,370**	**1,516**	**37,253**
Employees with functional food and natural health product related duties	4,713	6,185	4,718	643	16,259

1. Functional Food establishments: Includes Functional Food establishments with or without a service-providing component.
2. Natural Health Product establishments: Includes Natural Health Product establishments with or without a service-providing component.
3. Functional Food and Natural Health Product establishments: Includes establishments involved in Functional Food and Natural Health Products with or without a service-providing component.

Note(s): Totals may not add up due to rounding.
Source(s): Statistics Canada, The Functional Foods and Natural Health Products Survey, 2011.

In 2011, 12% of FFNHP establishments indicated that they had unfilled FFNHP positions (Table 9). The largest share of the vacancies (58%) was reported by natural health products establishments.

Sales, marketing or advertising and R&D were the most frequently reported competencies needed to fill FFNHP vacancies. Establishments involved in natural health products reported the largest number of vacancies in positions requiring manufacturing or production and quality control competencies. Functional food establishments indicated their highest vacancies in positions requiring research and development, manufacturing, as well as technical or engineering competencies.

Table 9
Establishments with unfilled positions and types of competencies required to fill these positions by sub-sector, 2011

	Functional food establishments [1]	Natural health product establishments [2]	Establishments active in both fields [3]	Service only establishments	All establishments
	number				
Total establishments with unfilled positions	**x**	**52**	**28**	**x**	**90**
Scientific research and development (R&D)	x	17	16	x	40
Intellectual property	0	x	x	0	10
Regulatory	0	12	x	x	26
Clinical trials	0	0	x	0	x
Manufacturing or production	x	28	x	x	39
Technical or engineering	x	14	x	x	29
Quality control	0	24	x	x	37
Sales, marketing or advertising	0	x	28	x	58
Market research	0	x	x	0	19
Management or finance	0	x	x	0	21
Business development	0	20	14	0	34
Other	0	x	0	0	x

1. Functional Food establishments: Includes Functional Food establishments with or without a service-providing component.
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3. Functional Food and Natural Health Product establishments: Includes establishments involved in Functional Food and Natural Health Products with or without a service-providing component.

Note(s): Totals may not add up due to rounding.
Source(s): Statistics Canada, The Functional Foods and Natural Health Products Survey, 2011.

In 2011, the main obstacles to filling vacant positions for FFNHP establishments included a lack of candidates with the right qualifications or expertise and high compensation requirements by candidates (Table 10).

Table 10
Establishments indicating obstacles that impacted efforts to fill positions by sub-sector, 2011

	Functional [1] food establishments	Natural [2] health product establishments	Establishments [3] active in both fields	Service only establishments	All establishments
	number				
Compensation requirements by candidates too high	13	31	27	0	72
Candidates unwilling to relocate	22	x	x	x	45
Candidates lack of expertise	35	28	7 E	12	82
Capital / resources insufficient to attract candidates	0	35	11	0	46
Competition for qualified candidates	x	16	x	0	31
Lack of qualified candidates	35	35	x	x	97
Access to training	0	x	x	x	13
Lack of business predictability	0	15	x	x	28
Other	0	x	0	x	x

1. Functional Food establishments: Includes Functional Food establishments with or without a service-providing component.
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3. Functional Food and Natural Health Product establishments: Includes establishments involved in Functional Food and Natural Health Products with or without a service-providing component.

Note(s): Totals may not add up due to rounding.
Source(s): Statistics Canada, The Functional Foods and Natural Health Products Survey, 2011.

10 Research and development

Total R&D spending by all FFNHP establishments amounted to $320 million (Table 11). Of this spending, 74% was directed to FFNHP products and services. Establishments active in both FF and NHP fields accounted for 45% of the FFNHP R&D spending, which was split almost equally between functional food and natural health products. NHP establishments also reported close to $100 million in FFNHP R&D spending devoted to NHPs. Meanwhile functional food establishments contributed 8% to the total FFNHP R&D expenditures.

Table 11
Research and development expenditures by sub-sector, 2011

	Functional [1] food establishments	Natural [2] health product establishments	Establishments [3] active in both fields	Service only establishments	All establishments
	thousands of dollars				
Total R&D spending (all sources)	**45,716**	**114,358**	**145,615**	**14,126**	**319,815**
Total spending on functional food R&D	**18,345**	**...**	**54,952** E	**236** E	**73,534**
Total spending on natural health product R&D	**...**	**98,130** E	**52,611** E	**13,820**	**164,560**

1. Functional Food establishments: Includes Functional Food establishments with or without a service-providing component.
2. Natural Health Product establishments: Includes Natural Health Product establishments with or without a service-providing component.
3. Functional Food and Natural Health Product establishments: Includes establishments involved in Functional Food and Natural Health Products with or without a service-providing component.

Note(s): Totals may not add up due to rounding.
Source(s): Statistics Canada, The Functional Foods and Natural Health Products Survey, 2011.

11 Financing

More than half of the FFNHP establishments that attempted to raise capital for FF or NHP purposes were successful in raising some or all of the funds requested. The total amount of capital raised for FFNHP purposes was $42 million (Table 12).

Of the FFNHP establishments that attempted to raise capital, almost 60% were NHP establishments. Among these establishments, 45% were successful in raising funds. No functional food establishments attempted to raise capital in 2011.

Table 12
Establishments that attempted to raise capital for functional food and natural health product purposes by sub-sector, 2011

	Functional [1] food establishments	Natural [2] health product establishments	Establishments [3] active in both fields	Service only establishments	All establishments
	number				
Establishments that attempted to raise capital	0	65	x	x	110
Establishments that were successful in raising capital	..	29	x	x	58
	thousands of dollars				
Total amount of capital raised	**..**	**x**	**22,921**	**x**	**41,781**

1. Functional Food establishments: Includes Functional Food establishments with or without a service-providing component.
2. Natural Health Product establishments: Includes Natural Health Product establishments with or without a service-providing component.
3. Functional Food and Natural Health Product establishments: Includes establishments involved in Functional Food and Natural Health Products with or without a service-providing component.

Note(s): Totals may not add up due to rounding.
Source(s): Statistics Canada, The Functional Foods and Natural Health Products Survey, 2011.

Half of the total capital raised for FFNHP purposes came from other foreign based venture capital (Table 13). Government funding provided 11% and conventional funds provided 7% of the funds raised by FFNHP establishments.

Table 13
Amount of capital raised by functional food and natural health product establishments by source and sub-sector, 2011

	All establishments
	thousands of dollars
Total	**41,781**
Canadian based venture capital	x
American based venture capital	0
Other foreign based venture capital	21,202 E
Conventional funds (i.e. banks, credit union, Initial Public Offering (IPO), Secondary Public Offering (SPO))	3,128
Angel investors or family members	x
Government(s) (i.e. Business Development Corporation (BDC), Farm Credit Canada (FCC), Export Development Corporation (EDC), Industrial Research Assistance Program (IRAP))	4,713
Partner’s from strategic alliances	x
Other	x

Note(s): Totals may not add up due to rounding.
Source(s): Statistics Canada, The Functional Foods and Natural Health Products Survey, 2011.

12 Service activities

For the FFNHP survey, a service was defined as the provision of facilities or activities required by other business units for a fee. Examples of such services include: accounting, insurance, extraction, custom manufacturing, scientific research and development, as well as technical and engineering or mechanical services.

In 2011, 49% FFNHP establishments provided services (Table 14). Just over half of the FFNHP establishments which provided services were NHP establishments.

Custom manufacturing or production or formulation represented 60% of all services provided by FFNHP establishments. Almost two-thirds of NHP establishments and three-quarters of FF establishments reported custom manufacturing or production or formulation as their main service activity. Thirty-six percent of FFNHP establishments indicated that they perform R&D and a similar number provide sales, marketing or advertising to other business units.

Fewer than 10% of FFNHP establishments provided only FFNHP services, to other business units and did not actually produce or develop any FFNHP products. About 40% of service-only establishments provided regulatory services, scientific research and development or quality control services to other FFNHP establishments in 2011.

Table 14
Establishments providing services by service type and sub-sector, 2011

	Functional [1] food establishments	Natural [2] health product establishments	Establishments [3] active in both fields	Service only establishments	All establishments
	number				
Establishments providing services	**31**	**186**	**84**	**66**	**368**
Scientific research and development (R&D)	10	47	47	27	131
Intellectual property	0	17	29	10	56
Regulatory	6 E	40	37	29	113
Clinical trials	0	6	20	7	33
Custom manufacturing or production or formulation	24	121	60	16	221
Extraction of bioactives or medicinal ingredients	0	11	x	x	21
Technical or engineering or mechanical	x	x	8 E	6 E	20
Quality control	7	49	37	25	118
Sales, marketing or advertising	x	70	45	x	131
Market research	x	28	25	x	62
Other	0	x	x	8	14

1. Functional Food establishments: Includes Functional Food establishments with or without a service-providing component.
2. Natural Health Product establishments: Includes Natural Health Product establishments with or without a service-providing component.
3. Functional Food and Natural Health Product establishments: Includes establishments involved in Functional Food and Natural Health Products with or without a service-providing component.

Note(s): Totals may not add up due to rounding.
Source(s): Statistics Canada, The Functional Foods and Natural Health Products Survey, 2011.

13 Distribution channels

The most common distribution channel used by FFNHP establishments in 2011 was direct to retailer (Table 15). Natural health product establishments also reported distributing direct to other manufacturers and wholesalers as their second preferred method of distribution. Functional food establishments favoured the other category of distribution channel along with direct selling. Establishments active in both fields reported a preference for using direct to retailers, as well as brokers or third party distributors, in addition to wholesalers as distribution channels.

Table 15
Proportion of functional foods and natural health products sales by distribution method and sub-sector, 2011

	Functional [1] food establishments	Natural [2] health product establishments	Establishments [3] active in both fields	Service only establishments	All establishments
	percent				
All revenue	**100**	**100**	**100**	**100**	**100**
Direct selling	23.1	14.4	3.5	0.0	14.3
Internet sales or mail order	..	10.8	0.3	0.0	2.5
Wholesaler	3.8	19.2	16.0	70.4	12.0
Direct to retailer	30.3	27.9	51.9	8.8	36.9
Direct to othe manufacturers	6.7	20.6	6.9	20.8	10.0
Multi-level marketing or network marketing	0.0	0.3	0.8	0.0	0.3
Broker or third party distributor	6.3	6.1	19.2	0.0	10.5
Other	29.7	0.7	1.3	0.0	13.4

1. Functional Food establishments: Includes Functional Food establishments with or without a service-providing component.
2. Natural Health Product establishments: Includes Natural Health Product establishments with or without a service-providing component.
3. Functional Food and Natural Health Product establishments: Includes establishments involved in Functional Food and Natural Health Products with or without a service-providing component.

Note(s): Totals may not add up due to rounding.
Source(s): Statistics Canada, The Functional Foods and Natural Health Products Survey, 2011.

In 2011, the shares of FFNHP sales were highest for the customer categories other retail and other manufacturers (Table 16). This pattern was mirrored by functional food establishments and those active in both fields. The sales for NHP establishments were more broadly distributed across all categories of customers.

Table 16
Proportion of functional foods and natural health products sales by customer type and sub-sector, 2011

	Functional [1] food establishments	Natural [2] health product establishments	Establishments [3] active in both fields	Service only establishments	All establishments
	percent				
All revenue	**100**	**100**	**100**	**100**	**100**
Direct to consumers	0.1	13.0	1.1	0.0	3.3
Health food store	0.4	14.6	6.1	0.0	5.5
Other retail (e.g. grocery store, mass merchandiser)	55.3	6.7	34.0	0.0	36.8
Pharmacy	0.1	10.0	6.6	0.0	4.5
Wholesaler	2.6	11.0	15.1	34.2 E	9.0
Private label	..	18.0	6.5	29.1	6.5
Other manufacturers	28.9	7.6	29.5 E	36.7 E	24.5
Other	12.6	19.0	1.1	0.0	10.0

1. Functional Food establishments: Includes Functional Food establishments with or without a service-providing component.
2. Natural Health Product establishments: Includes Natural Health Product establishments with or without a service-providing component.
3. Functional Food and Natural Health Product establishments: Includes establishments involved in Functional Food and Natural Health Products with or without a service-providing component.

Note(s): Totals may not add up due to rounding.
Source(s): Statistics Canada, The Functional Foods and Natural Health Products Survey, 2011.

14 Partnership agreements and contracting out

Just over one-fifth of establishments in FFNHP stated that they were involved in some type of FFNHP related cooperative or collaborative arrangement with other business units or organizations either inside or outside of Canada in 2011 (Table 17). A cooperative or collaborative arrangement involves the active participation by multiple business units or organizations in projects to develop or continue work on new or significantly improved functional foods or natural health products or related activities (e.g. scientific expertise, regulatory affairs, training, marketing, distribution, clinical trials, etc.).

In 2011, FFNHP establishments indicated that they were involved in cooperative and collaborative arrangements most frequently with other business units. The number of partnership agreements, with business units in Canada and outside of Canada was almost equal. Almost thirty percent of establishments with partnerships indicated that the agreements were with universities in Canada.

Table 17
Establishments with cooperative or collaborative arrangements by partner type, 2011

	All establishments
	number
All establishments with partnership arrangements	**163**
Other business units in Canada	90
Other business units outside Canada	89
University in Canada	48
University outside Canada	18
Federal Government Agency or laboratory	24
Provincial Government Agency or laboratory	26
Other	7

Note(s): Totals may not add up due to rounding.
Source(s): Statistics Canada, The Functional Foods and Natural Health Products Survey, 2011.

Contracting out as defined in the FFNHP survey refers to paying another business unit for service on a contractual basis. In 2011, 43% of FFNHP establishments contracted out FFNHP related activities (Table 18). Almost 70% of these establishments were natural health product establishments. Few service-only establishments (3%) and functional food establishments (5%) contracted out work related to FFNHP activities.

Table 18
Establishments contracting out functional food or natural health product related activities by sub-sector, 2011

	Functional food establishments [1]	Natural health product establishments [2]	Establishments active in both fields [3]	Service only establishments	All establishments
	number				
Establishments that have contracted out	**17**	**225**	**68**	**11**	**321**

1. Functional Food establishments: Includes Functional Food establishments with or without a service-providing component.
2. Natural Health Product establishments: Includes Natural Health Product establishments with or without a service-providing component.
3. Functional Food and Natural Health Product establishments: Includes establishments involved in Functional Food and Natural Health Products with or without a service-providing component.

Note(s): Totals may not add up due to rounding.
Source(s): Statistics Canada, The Functional Foods and Natural Health Products Survey, 2011.

Most (84%) NHP establishments contracted out for custom manufacturing or production or formulation and 46% contracted out quality control activities related to FFNHP (Table 19).

Table 19
Establishments contracting out functional food or natural health product related activities by purpose and sub-sector, 2011

	Functional food establishments [1]		Natural health product establishments2		Establishments active in both fields [3]	
	Canadian	Foreign	Canadian	Foreign	Canadian	Foreign
	number					
Scientific research & development	x	0	55	x	25	14
Intellectual property	0	0	35	25	x	x
Regulatory	x	x	88	x	37	16
Clinical trials	x	0	17	x	25	22
Custom manufacturing or production or formulation	x	7 E	190	46	51	25
Extraction of bioactive or medicinal ingredients	0	0	x	20	23	x
Technical or engineering or mechanical	x	0	11	0	22	7 E
Quality control	x	0	103	18	36	9
Sales or marketing or advertising	x	x	56	20	28	x
Market research or business development	0	x	33	18	x	x
Other	0	0	x	0	0	x

1. Functional Food establishments: Includes Functional Food establishments with or without a service-providing component.
2. Natural Health Product establishments: Includes Natural Health Product establishments with or without a service-providing component.
3. Functional Food and Natural Health Product establishments: Includes establishments involved in Functional Food and Natural Health Products with or without a service-providing component.

Note(s): Totals may not add up due to rounding.
Source(s): Statistics Canada, The Functional Foods and Natural Health Products Survey, 2011.

15 Intellectual property

Intellectual property is an important contributor to the competitiveness of FFNHP establishments. Almost a quarter of FFNHP establishments made use of trade secrets to protect their intellectual property in 2011 (Table 20). Twenty three percent of FFNHP establishments made use of registered trademarks and 13% paid others for intellectual property by acquiring FFNHP licenses. NHP establishments and those active in both fields accounted for most of the FFNHP related intellectual property development.

In 2011, only 13% of FFNHP establishments indicated that they had FFNHP related patents or pending patents. More than half of those were natural health product establishments. FF establishments reported no patents.

Table 20
Establishments that developed functional food and natural health product related intellectual properties by sub-sector, 2011

	Functional food establishments [1]	Natural health product establishments [2]	Establishments active in both fields [3]	Service only establishments	All establishments
	number				
Establishments granting functional food or natural health product licensing agreements	0	35	x	x	53
Establishments that acquired functional foods or natural health products licensing agreements	0	67	33	0	100
Establishments that developed trade secrets	27	66	78	9	181
Establishments that registered trademarks	9	82	76	8	175
Establishments with functional food or natural health product related patents or pending patents	0	50	x	x	94

1. Functional Food establishments: Includes Functional Food establishments with or without a service-providing component.
2. Natural Health Product establishments: Includes Natural Health Product establishments with or without a service-providing component.
3. Functional Food and Natural Health Product establishments: Includes establishments involved in Functional Food and Natural Health Products with or without a service-providing component.

Note(s): Totals may not add due up to rounding.
Source(s): Statistics Canada, The Functional Foods and Natural Health Products Survey, 2011.

Almost all of the FFNHP related pending patents (96%) and existing patents (91%) were held by establishments active in both fields (Table 21).

Table 21
Functional food and natural health product related patents and pending patents worldwide by sub-sector, 2011

	Functional [1] food establishments	Natural [2] health product establishments	Establishments [3] active in both fields	Service only establishments	All establishments
	number				
Existing patents	0	86	870 E	0	956 E
Pending patents	0	x	1,720 E	x	1,788 E

1. Functional Food establishments: Includes Functional Food establishments with or without a service-providing component.
2. Natural Health Product establishments: Includes Natural Health Product establishments with or without a service-providing component.
3. Functional Food and Natural Health Product establishments: Includes establishments involved in Functional Food and Natural Health Products with or without a service-providing component.

Note(s): Totals may not add up due to rounding.
Source(s): Statistics Canada, The Functional Foods and Natural Health Products Survey, 2011.

16 Regulations

FFNHP products are rigorously regulated by Health Canada and the Canadian Food Inspection Agency. In 2011, almost eight out of every ten FFNHP establishments reported that they had some type of contact with the Health Canada Food Directorate, Health Canada Natural Health Products Directorate or the Canadian Food Inspection Agency (Table 22).

Table 22
Establishments that contacted Health Canada or the Canadian Food Inspection Agency by sub-sector, 2011

	Functional [1] food establishments	Natural [2] health product establishments	Establishments [3] active in both fields	Service only establishments	All establishments
	number				
Total	**82**	**328**	**119**	**60**	**590**

1. Functional Food establishments: Includes Functional Food establishments with or without a service-providing component.
2. Natural Health Product establishments: Includes Natural Health Product establishments with or without a service-providing component.
3. Functional Food and Natural Health Product establishments: Includes establishments involved in Functional Food and Natural Health Products with or without a service-providing component.

Note(s): Totals may not add up due to rounding.
Source(s): Statistics Canada, The Functional Foods and Natural Health Products Survey, 2011.

FF establishments that contacted the Canadian Food Inspection Agency (CFIA) were most often looking for information on labelling and advertising, as well as exports (Table 23). Those that communicated with Health Canada's Food Directorate did so principally to get information on submissions for health claims on food and for labelling and advertising.

Establishments active in both fields that contacted Health Canada's Food Directorate most often sought information on submissions for health claims on food and novel food designation. Their reasons for contacting the CFIA were not concentrated in any one information need.

Table 23
Percentage of establishments that contacted Health Canada Food Directorate or the Canadian Food Inspection Agency for regulatory information by type of contact and sub-sector, 2011

	Functional food establishments [1]			Establishments active in both fields [2]		
	Health Canada Food Directorate	Canadian Food Inspection Agency	Not applicable	Health Canada Food Directorate	Canadian Food Inspection Agency	Not applicable
	percent					
Novel food designation	2.0	30.9	67.1	15.5	8.8	79.7
Submission for health claim on food	38.4	26.0	59.8	31.1	13.4	57.9
Clinical trial approval	12.1	...	87.9	6.4	...	77.8
Labelling and advertising	33.1	70.3	29.7	8.7	16.1	48.3
Export of food or natural health products	24.3	56.3	43.7	8.6	14.1	55.9
Import of food or natural health products	24.3	36.8	63.2	8.7	10.1	60.4
Other	0.0	6.8	93.2	0.0	3.8	96.2

1. Functional Food establishments: Includes Functional Food establishments with or without a service-providing component.
2. Functional Food and Natural Health Product establishments: Includes establishments involved in Functional Food and Natural Health Products with or without a service-providing component.

Note(s): Totals may not add up due to rounding.
Source(s): Statistics Canada, The Functional Foods and Natural Health Products Survey, 2011.

In 2011, the most often cited reason that NHP establishments and those active in both fields contacted Health Canada's Natural Health Products Directorate (HC NHPD) was for information on product licenses. Over two-thirds of NHP establishments that had contact with HC NHPP wanted to obtain information on site licenses for natural health products (Table 24). Close to 60% of NHP establishments and 71% of establishments active in both fields had contact with HC NHPD concerning health claims for natural health products. Clinical trial approval was the least common reason for regulatory contact with HC NHPD by NHP establishments and those active in both fields.

Table 24
Percentage of establishments that contacted Health Canada Natural Health Products Directorate for regulatory information by type of contact and sub-sector, 2011

	Natural health product establishments [1]		Establishments active in both fields [2]	
	Health Canada Natural Health Products Directorate	Not applicable	Health Canada Natural Health Products Directorate	Not applicable
	percent			
Site license for natural health products	66.9	33.1	59.8	40.2
Product license for natural health products	86.5	13.5	74.0	26.0
Health claim for natural health products	58.9	41.1	71.2	28.8
Clinical trial approval	5.7	94.3	15.8	77.8
Labelling and advertising	30.6	64.5	37.0	48.3
Export of food or natural health products	19.1	75.2	34.0	55.9
Import of food or natural health products	13.1	81.0	33.5	60.4
Other	0.0	99.6	0.0	96.2

1. Natural Health Product establishments: Includes Natural Health Product establishments with or without a service-providing component.
2. Functional Food and Natural Health Product establishments: Includes establishments involved in Functional Food and Natural Health Products with or without a service-providing component.

Note(s): Totals may not add up due to rounding.
Source(s): Statistics Canada, The Functional Foods and Natural Health Products Survey, 2011.

Of the various regulatory bodies associated with FFNHP activities, service-only establishments had the most contact with HC NHPD and were most frequently looking for information concerning site licenses, product licenses and health claims for NHPs (Table 25).

Table 25
Percentage of service-only establishments that contacted Health Canada or the Canadian Food Inspection Agency for regulatory information by type of contact, 2011

	Service-only establishments			
	Health Canada Food Directorate	Health Canada Natural Health Products Directorate	Canadian Food Inspection Agency	Not applicable
	percent			
Novel food designation	11.6	...	9.5	83.5
Submission for health claim on food	18.9	...	9.5	81.1
Site license for natural health products	...	76.2	...	23.8
Product license for natural health products	...	64.5	...	35.5
Health claim for natural health products	...	59.1	...	40.9
Clinical trial approval	4.6	13.7	...	86.3
Labelling and advertising	16.5	37.5	9.3	55.3
Export of food or natural health products	0.0	14.7	0.0	85.3
Import of food or natural health products	0.0	9.2	2.3	88.4
Other	2.2	0.0	9.2	90.8

Note(s): Totals may not add up due to rounding.
Source(s): Statistics Canada, The Functional Foods and Natural Health Products Survey, 2011.

17 Number of products

In 2011, there were 32,266 FFNHP related product lines sold, 85% of which were in the NHP category (Table 26).[4] Establishments active in both FF and NHP fields had 83% of their FFNHP products lines in NHP.

Over half of the product lines on the market were sold exclusively to customers in Canada. An additional 40% of products were sold to customers both in and outside of Canada.

Products in development were defined in the survey as those which had completed the screening and evaluation process for business cases that included target markets, benefits to the customer and descriptions of product features and attributes. In total, FFNHP establishments listed 4,658 products in development in 2011. Three-quarters of those products were classified in natural health product lines.

Table 26
Functional food or Natural health product related product lines in development or on the market by sub-sector, 2011

	Functional food establishments [1]	Natural health product establishments [2]	Establishments active in both fields [3]		All establishments	
	Product line					
	Functional food line	Natural Health Product line	Functional food line	Natural Health Product line	Functional food line	Natural Health Product line
	number					
Total products in development	**338** E	**1,922**	**839**	**1,558**	**1,177**	**3,481**
Total products sold	**3,444** E	**19,818**	**1,521**	**7,483**	**4,965**	**27,301**
Products sold only to customers in Canada	F	11,890	1,048	2,738	2,775 E	14,628
Products sold only to customers outside of Canada	F	901	151	F	222	1,576
Products sold both to customers in Canada and outside of Canada	F	7,027	322	4,070	F	11,097

1. Functional Food establishments: Includes Functional Food establishments with or without a service-providing component.
2. Natural Health Product establishments: Includes Natural Health Product establishments with or without a service-providing component.
3. Functional Food and Natural Health Product establishments: Includes establishments involved in Functional Food and Natural Health Products with or without a service-providing component.

Note(s): Totals may not add up due to rounding.
Source(s): Statistics Canada, The Functional Foods and Natural Health Products Survey, 2011.

4. Respondents were asked not to consider different package sizes, labels and product flavours or formats as separate product lines.

18 Product area

In the FFNHP survey, respondents were asked to select one health benefit for each product. The promotion of health and wellness was the most often reported health benefit for products across all FFNHP establishments (Table 27). Products relating to sleep, gut health, eye health, stress, weight control, anti-aging and skin health are examples where claims for overall health and well-being are often made. Due to the large product lines of vitamins, minerals and amino acids in which NHP establishments specialize, supplements was one of their key health claims. The reduction of risk of diseases such as cardiovascular, cancer, diabetes and arthritis was also an important health benefit reported by a large number of functional food and natural health product establishments.

Table 27
Number of establishments by main targeted health claim for their functional food products or natural health products by health benefit and sub-sector, 2011

	Functional food establishments [1]	Natural health product establishments [2]	Establishments active in both fields [3]	All establishments
	number			
Reduction of risk of disease	36	219	98	354
Health and wellness promotion	89	341	127	556
Performance enhancement	16	179	79	274
Special populations	19	173	69	261
Supplements	17	233	87	336
Other	0	x	x	9

1. Functional Food establishments: Includes Functional Food establishments with or without a service-providing component.
2. Natural Health Product establishments: Includes Natural Health Product establishments with or without a service-providing component.
3. Functional Food and Natural Health Product establishments: Includes establishments involved in Functional Food and Natural Health Products with or without a service-providing component.

Note(s): Totals may not add up due to rounding.
Source(s): Statistics Canada, The Functional Foods and Natural Health Products Survey, 2011.

19 Input supply

Establishments were asked to identify the types of bioactive and medicinal ingredients used in the production of their FFNHP products. Table 28 illustrates that around one out of three FFNHP establishments indicated floriculture, herbs and spices, seafood or other marine species and fruits as a source of bioactive and medicinal ingredient. FF establishments reported dairy products and oil seeds as the ingredients most frequently sourced.

Table 28
Establishments by source of the bioactive/medicinal ingredients used in the production of functional food or natural health products by sub-sector, 2011

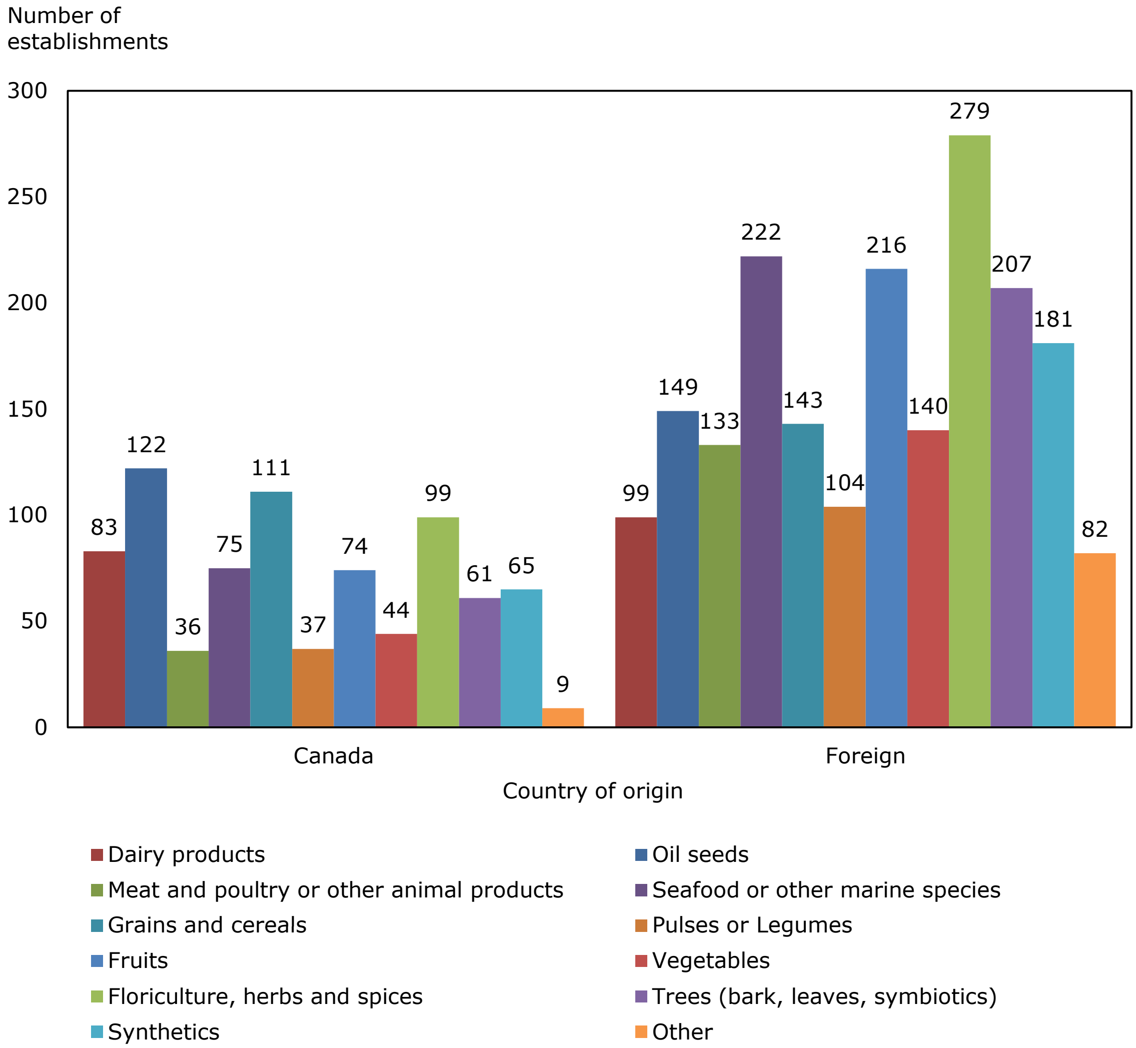
	Functional [1] food establishments	Natural [2] health product establishments	Establishments [3] active in both fields	Service only establishments	All establishments
	number				
Dairy products	42	62	51	10	165
Oil seeds	32	115	58	11	216
Meat and poultry or other animal products	x	123	20	x	152
Seafood or other marine species	x	158	62	x	244
Grains and cereals	x	78	45	x	164
Pulses or Legumes	x	58	42	x	120
Fruits	16	140	79	7	242
Vegetables	11	98	56	11	176
Floriculture, herbs and spices	6	217	68	12	303
Trees (bark, leaves, symbiotics)	0	160	59	13	232
Synthetics	x	139	48	x	194
Other	27	34	x	x	88

1. Functional Food establishments: Includes Functional Food establishments with or without a service-providing component.
2. Natural Health Product establishments: Includes Natural Health Product establishments with or without a service-providing component.
3. Functional Food and Natural Health Product establishments: Includes establishments involved in Functional Food and Natural Health Products with or without a service-providing component.

Note(s): Totals may not add up due to rounding.
Source(s): Statistics Canada, The Functional Foods and Natural Health Products Survey, 2011.

In 2011, more establishments indicated that the bioactive or medicinal ingredients used in their FFNHP products were manufactured in foreign countries than in Canada (Chart 2). Most indicated that the floriculture, herbs and spices along with seafood or other marine species and fruits that were used in FFNHP products were supplied from foreign sources. Dairy products, oil seeds, as well as grains and cereals were more equally sourced from both Canadian and foreign suppliers.

Chart 2
Establishments by the source of the bioactive/medicinal ingredients and country of origin, 2011

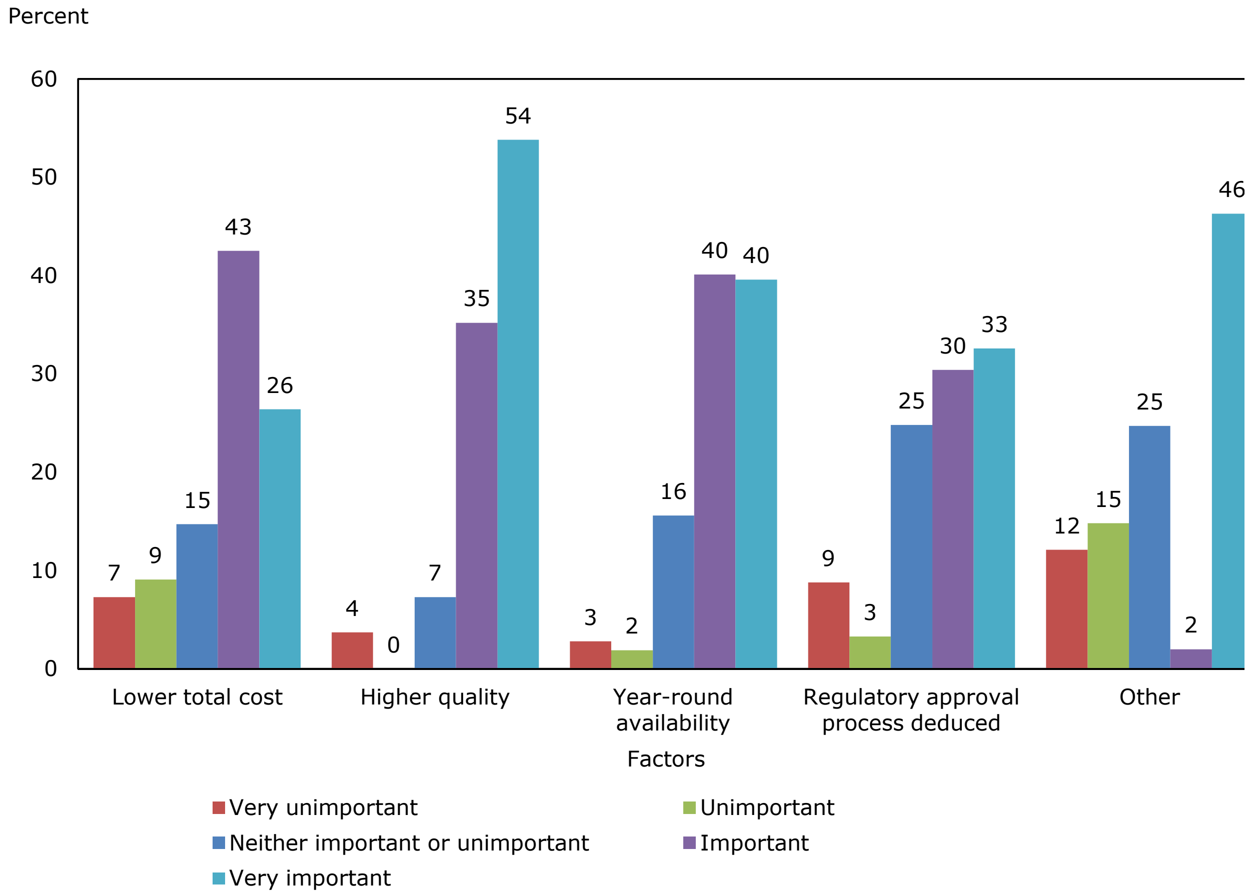


Note: Totals may not add up due to rounding.

Source: Statistics Canada, The Functional Foods and Natural Health Products Survey 2011.

Quality was one of most important factors considered by all FFNHP establishments when choosing between bioactive and medicinal ingredients available both in Canadian and foreign markets (Chart 3). Year-round availability, regulatory approval and other factors were more often reported to be more important than lower total cost.

Chart 3
Level of importance for importing bioactive/medicinal ingrediant by factor, 2011



Note: Totals may not add up due to rounding.

Source: Statistics Canada, The Functional Foods and Natural Health Products Survey 2011.

20 Summary

The results from the 2011 Functional Foods and Natural Health Products survey indicate that 750 establishments were active in the area of functional foods and natural health products and generated a total of $11.3 billion in FFNHP revenue. Total FFNHP exports amounted to almost $1.7 billion while imports totaled almost $337 million. Over 16,000 individuals made up the FFNHP labour force. The extensive product market for FFNHP had available 32,266 individual product lines being sold both inside Canada and abroad. Total spending on FFNHP research and development amounted to $238 million with over 4,500 products in development.

Functional food and natural health products remains an emerging activity that continues to grow within establishments focused on the enhancement and value added processing and extraction of food and bioactive ingredients. These establishments develop and produce new products and services aimed at improving the quality of health of Canadians and help reduce their health risk.

Appendix I — Appendix I

Concepts and methodology

This report profiles establishments engaged in functional food and natural health product related activities in Canada based on data from the 2011 Functional Foods and Natural Health Products (FFNHP) Survey, conducted in partnership with Agriculture and Agri-Food Canada. The 2011 survey collected information on the activities of establishments for their 2011-12 fiscal year. Previous iterations of the survey were in 2003, 2005 and 2007.

Concepts

Establishment

The establishment is the statistical unit for the FFNHP survey. An establishment is the production entity or smallest grouping of production entities which:

- produces a homogeneous set of goods or services;
- does not cross provincial boundaries; and
- provides data on the value of output together with the cost of principal intermediate inputs used along with the cost and quantity of labour resources used to produce the output.

For example, a plant in the manufacturing industry which provides accounting information regarding the value of shipments (sales), direct costs and labour costs, is considered a single establishment. However, two stores in the retail industry may be considered one establishment if the accounting information described above, is not available separately, but is combined at a higher level.

A production entity is a physical unit where business operations are carried out. It must have a civic address and dedicated labour.

Establishments range from start-ups to multinationals.

Coverage

The target population for the FFNHP survey included all establishments in Canada who developed, produced or provided services related to functional foods or natural health products for the purpose of human consumption during the reference period. Products specifically excluded were pet food, feed, cosmetics and topical creams.

Establishments which strictly retailed or wholesaled functional foods or natural health products were excluded as were establishments of the following types: not-for-profit organizations, associations, alliances, unions, universities, as well as government agencies, departments and commissions.

The survey frame was developed in several stages. Agriculture and Agri-Food Canada compiled a list of business units they identified as engaged in functional food and natural health product-related activities in Canada. Additional units were added to this list from respondents to the 2007 iteration of the survey and from other related external data sources. Businesses in the list were then matched to units on the Statistics Canada Business Register and duplicates were removed. The final survey frame comprised 1,623 establishments engaged in functional food and natural health product-related activities.

The target populations for the 2007 and 2011 iterations of the Functional Foods and Natural Health Product surveys were the same. However, the statistical units and the survey frames were different. In 2011, the survey targeted individual establishments. In 2007, the survey targeted groups of establishments belonging to the same enterprise and located in the same province. The frames for each year were compiled from all available data sources which were different across the two reference periods. As a result, survey estimates for 2007 and 2011 cannot be compared.

Collection

The FFNHP survey used a paper questionnaire to collect data from respondents. This questionnaire was designed by Statistics Canada in co-operation with Agriculture and Agri-Food Canada and in consultation with a group of functional food and natural health product experts. Following the initial design work, the questionnaire was field-tested with potential respondents. Their comments on the design and content were incorporated into the final version.

All establishments were "pre-contacted" by telephone to confirm that they were in-scope for the survey, as well as to determine the name and mailing address for the senior plant manager or research and development manager who would be asked to complete the questionnaire.

Data were collected using a mail out/mail back questionnaire. Questionnaires were mailed to 1,233 establishments following pre-contact. Respondents were asked to return the completed questionnaire within 30 days of receipt. Follow-up for non-response was conducted by telephone and fax. Upon receipt, the collected questionnaires were imaged and data from the questionnaires was captured. The response rate for this survey was 50.6%.

Error detection

Error detection was an integral part of both collection and data processing activities. Automated edits were applied to data records during collection to identify capture and reporting errors. During collection, respondents were contacted by telephone to validate collected data which failed edits.

Prior to imputation, subject matter specialists used a variety of tools to identify and resolve inconsistencies and outliers in the collected data. This review of the micro data focused on records which would have the most significant impact on the final survey estimates either because of the size of their contribution or because of their use in imputation. Problems were resolved using historical and administrative data, data from other surveys, and information from other external sources.

Following imputation, subject matter specialists compared patterns in the current estimates with those observed in data from previous iterations of the survey, where possible. The largest differences in the patterns were investigated by reviewing the source of the change in the micro data and resolving any remaining data issues.

Imputation

Imputation was used to determine plausible values for all variables that were missing or inconsistent in the collected data and which could not be resolved through editing. A number of different approaches were used to impute missing or inconsistent data. The simplest technique involved using a group of deterministic and coherence rules that dictate acceptable relationships among variables and derive missing values residually. Missing variables were also imputed by applying the ratios between variables and historical trends observed in the respondent data, to data records with partial information. Direct replacement of missing variables with data from other sources was another imputation approach used. Lastly, donor imputation was also used. This involved identifying a respondent record (donor) that was similar to the record which required imputation (recipient) based on information which was available for both businesses. The data available for the respondent was then used to derive that for the record requiring imputation.

Imputation groups were based on a number of criteria including establishment type, various measures of size, complexity and province or region. Data from selected survey questions were used to assign an establishment type to each respondent. Seven establishment types were defined as follows: functional foods only; natural health products only; services only; functional foods and natural health products; functional foods and services; natural health products and services; and functional foods, natural health products and services. No imputation was done for records when their establishment type could not be assigned.

Estimation

A complete micro data file was created for all establishments in the survey population for which data were reported or could be imputed. In a census, each establishment in the population would ordinarily represent only itself in the estimates with a weight of 1. However, no imputation was done for records when their establishment type could not be assigned. These records were treated as non-respondents. As a result, weights on all records were adjusted by a factor to account for survey non-response so that the final estimates would be representative of the entire survey population.

Quality evaluation

Survey estimates were compared with estimates from previous iterations of the survey where possible. In addition, subject matter experts from outside Statistics Canada were given an opportunity to review the estimates and provide feedback on quality prior to their release.

Disclosure control

Statistics Canada is prohibited by law from releasing any information it collects which could identify any person, business, or organization, unless consent has been given by the respondent or as permitted by the Statistics Act. Various confidentiality rules are applied to all data which are released or published to prevent the publication or disclosure of any information deemed confidential. If necessary, data are suppressed to prevent direct or residual disclosure of identifiable data.

In order to prevent any data disclosure, confidentiality analysis was done using the Statistics Canada's G-CONFID system. G-CONFID was used for primary confidentiality as well as for the secondary suppression (residual disclosure). Direct disclosure or primary confidentiality occurs when the value in a tabulation cell is composed or dominated by few enterprises. Residual disclosure occurs when confidential information can be derived indirectly by piecing together information from different sources or data series.

Data accuracy

The data accuracy indicators used for the Functional Foods and Natural Health Products Survey were the standard error and the coefficient of variation. The standard error is a commonly used statistical measure indicating the error of an estimate associated to sampling and to adjustments made because of complete non-response. For this survey, there was no error associated to sampling. The coefficient of variation is the standard error expressed as a percentage of the estimate. The reliability of the data was reported using the symbol convention in Table 1.

Text table 1
Quality Indicators

Symbol	Meaning	Coefficient of variation	Standard error
A	Excellent	< 5.0 %	< 2.5 %
B	Very Good	≥ 5.0 % and < 10.0 %	≥ 2.5 % and < 5.0 %
C	Good	≥ 10.0 % and < 15.0 %	≥ 5.0 % and < 7.5 %
D	Acceptable	≥ 15.0 % and < 25.0 %	≥ 7.5 % and < 10.0 %
E	Use with caution	≥ 25.0 % and < 35.0 %	≥ 10.0 % and < 15.0 %
F	Too unreliable to be published	≥ 35.0 %	≥ 15.0 %