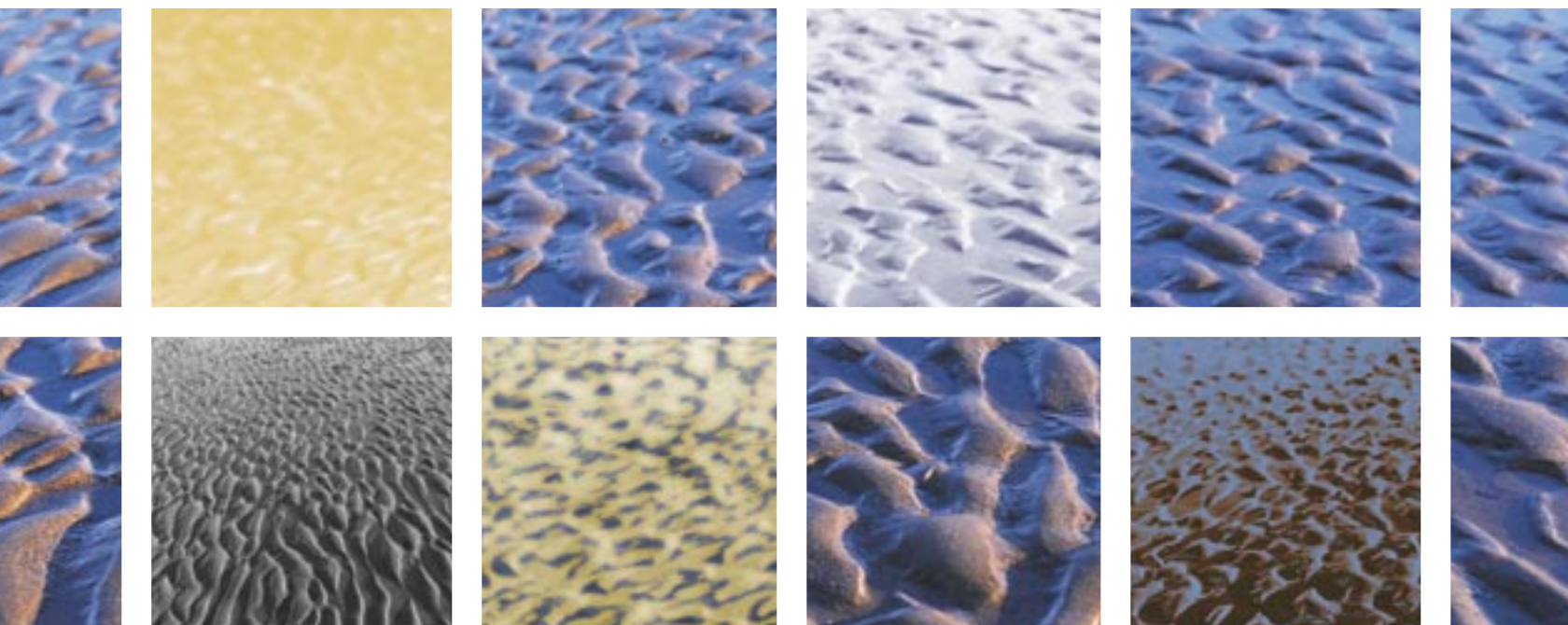




# A Competitiveness Survey of the British Columbia Salmon Farming Industry

Aquaculture Development Branch  
Ministry of Agriculture, Food & Fisheries



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## 1.0 INTRODUCTION

BC is the world's fourth largest farmed salmon producing region, after Norway, Chile and the United Kingdom. A government-imposed moratorium on new salmon farm sites has prevented the issuance of new tenures to the industry during the past decade, despite the existence of a significant coastline that offers good growing conditions for salmon.

The moratorium on new salmon farm sites was lifted in September 2002 when a new regulatory framework was completed. A number of issues continue to affect the competitiveness of the industry, including many of which are influenced by government policy.

Accordingly, the Ministry of Agriculture, Food & Fisheries ("the Ministry") has asked PricewaterhouseCoopers LLP to undertake a competitiveness assessment of the British Columbia salmon farming industry.

The purpose of the assessment is to determine areas in which government can help increase the competitiveness of the industry. The specific objectives of the work are to identify:

- areas where the British Columbia salmon industry is not competitive and the underlying causes;
- industry research and development priorities; and
- suggested public policy priorities.

The Ministry requested that PricewaterhouseCoopers LLP conduct a confidential survey of salmon farming companies. In the study, all of the BC salmon farms were surveyed. A copy of the survey questionnaire is shown in Appendix A.

The study was led by a Steering Committee from the Aquaculture Development Branch of the Ministry. The survey questionnaire was developed in consultation with the Steering Committee and pre-tested with four industry participants.

Nine farming companies responded to the survey, including all five with operations in other regions (the "major farms"). The respondents are listed in Appendix B. The production represented by these respondent salmon farming companies represents over 95% of the BC production in 2001 and 2002.

Cost data were supplied by the five major farms for the following regions.

<b>British Columbia</b>	<b>New Brunswick</b>	<b>Norway</b>	<b>Chile</b>	<b>United Kingdom</b>
5	2	2	4	4

While we have compiled the data and believe them to be accurate, the results have not been audited or otherwise verified by PricewaterhouseCoopers LLP. PricewaterhouseCoopers LLP accepts no responsibility whatsoever for any errors or omissions in the data.

In the following section, we briefly profile the salmon farming industry. In Section 3.0 we describe comparative costs of production. In Section 4.0 we describe the relative importance of competitiveness factors. In Section 5.0 we describe industry research and development priorities. In Section 6.0 we describe suggested public policy priorities. In Section 7.0, we provide a summary of the findings.

## 2.0 OVERVIEW OF THE SALMON FARMING INDUSTRY

Farmed salmon production on a worldwide basis in 2001 was 1.3 million tonnes. Similar farming methods are employed around the world; the vast majority of farmed salmon are reared in seacages during the production growout phase. The production cycle also includes a critical freshwater phase.

Norway and Chile are the largest producers of farmed salmon, producing about two thirds of the world total. In Canada, salmon are farmed in BC, New Brunswick and, to a lesser degree, other provinces in Atlantic Canada. Canada produced 95,000 tonnes in 2001, of which BC production was 62,000 tonnes, or about 5% of the world total.

International trade in farmed salmon has been increasing. The major markets are North America, Europe and Japan. The US currently represents the largest import market for farmed salmon. This import market is valued at over \$1.2 billion and represents about 10% of all US seafood imports.

BC producers export over three quarters of their production to the US. They compete primarily with Chile and New Brunswick in the US market. The relative shares in 2001 are shown below.

### US Imports of Farmed Salmon – 2001 Market Share by Value for All Products

British Columbia	29%
New Brunswick	18%
Chile	47%
Norway	4%
United Kingdom	2%
<b>Total</b>	<b>100%</b>

Source: PricewaterhouseCoopers, “Net Results – Northern Aquaculture Statistics – 2001” in *Northern Aquaculture*, August 2002.  
Market share data is based on value.

Most of the marketing efforts of the industry have been on the availability of fresh fish on a year-round basis. Both whole dressed fish and filleted production, the main products, are now commodity oriented. A general trend of downward pressure on prices is having the effect of expanding the market and, for producers, of intensifying the focus on lowering costs.

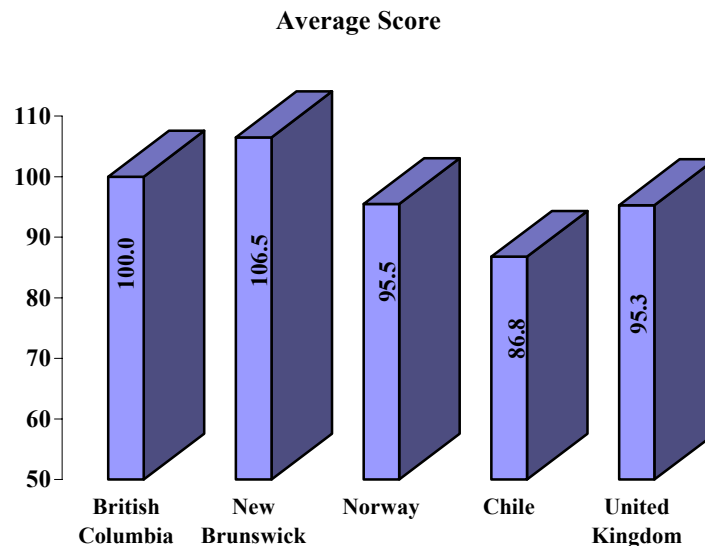
### 3.0 COMPARATIVE COSTS OF PRODUCTION

The first part of the survey deals with comparative costs of production. The survey was designed to be indicative only of recent costs of production, in order to protect the confidentiality of actual farm data and to encourage participation.

The major farms were asked to compare salmon farming production costs in the province to other regions where they or their affiliates also farm salmon. A summary comparison is shown in Exhibit 1.

#### EXHIBIT 1: COMPARATIVE COSTS OF PRODUCTION

**Using 100 as a base index for British Columbia, compare your company’s salmon farming production costs in the province to other regions where your company and its affiliates also farm salmon.**



Production costs reported in the survey are within fairly narrow ranges. The widest spreads were with transport to market. The narrowest were with labour, processing and depreciation.

With the exception of those farms operating in New Brunswick, the major farms in BC have higher production costs than in other regions they operate in. The BC industry's costs ranked medium to high in most categories, and along with the UK, ranked lowest in transport costs to market.

The BC costs tend to be higher relative to its main competitors primarily due to logistics. Lack of economies of scale in smolt production and lack of access to fast-growing, low-maturing stocks are also factors influencing higher costs. In addition, written comments suggest there are higher regulatory costs in BC – these tend to negatively influence other costs and also increase management burden.

New Brunswick's higher production costs are, on average, about 7% higher than the base index for BC, due to higher smolt costs and longer growout periods. Offsetting some of the higher costs in New Brunswick are slightly higher prices than those obtained in BC.

Producers with operations in Norway and the UK have similar costs, which are about 5% lower than BC. Producers there have lower costs due to lower smolt and labour costs that are influenced by greater economies of scale. The relative differences in costs of production between Norway and the UK, as with all producing countries, are also impacted by fluctuations in exchange rates.

Producers with operations in Chile have the lowest production cost by a wide margin, on average over 13% lower than BC. Chile ranked the lowest in all major cost categories except for transport to market. In particular, Chile has the lowest smolt, feed, labour and depreciation costs.

#### **4.0 RELATIVE IMPORTANCE OF BUSINESS FACTORS**

A number of business factors that influence both revenues and costs in salmon farming can be sources of competitive advantage.

All of the salmon farms surveyed were asked to rate the importance of 35 business factors. Results were compiled and averaged based on a common scale.

Of the 35 business factors, only seven were ranked as contributing to competitiveness, while three were ranked as neutral. The balance of the 25 factors ranked as impeding competitiveness.

The business factors ranked highest were proximity to markets and the Canadian/US dollar exchange rate. Other factors ranked high were availability of professional services, provincial regulations regarding labour, and business arrangements with First Nations.

The business factors ranked as neutral were international trade support, access to capital and access to public R&D facilities.

The business factors ranked lowest were the costs associated with the provincial and federal new tenure application process, the timelines for application approvals, and the public image of aquaculture.

The results are summarized in Exhibit 2.



## EXHIBIT 2: RELATIVE IMPORTANCE OF BUSINESS FACTORS

In the current British Columbia business climate, on a scale of 1 to 7, rank the extent to which the following are contributing (7) or impeding (1) your company's ability to compete in international markets.

	Average Score
<b>General:</b>	
• Current economies of scale	2.8
• Proximity to markets	6.6
• Canadian/US dollar exchange rate	5.7
<b>Provincial Regulations regarding Marine Sites:</b>	
• Costs of new tenure application process	1.8
• Timeline for application approvals	2.8
• Tenure rent costs	4.2
• On going costs of compliance for approved tenures	2.3
<b>Provincial Regulations regarding Freshwater Sites:</b>	
• Costs of new site application process	2.5
• Timeline for application approvals	2.7
• Tenure rent costs (if applicable)	3.7
• On going costs of compliance for approved sites	3.5
• Regulations regarding processing	3.5
• Regulations regarding labour	4.8
<b>Federal Regulations regarding Marine Tenures:</b>	
• Costs of new site application process	1.9
• Timeline for application approvals	1.7
• On going costs of compliance for approved sites	2.2
• Regulations related to introductions and transfers	3.0
• Regulations regarding processing	3.2
• International trade support	4.0
<b>Taxation Policy:</b>	
• Corporate taxation	3.1
• Personal taxation	3.0
• Provincial R&D tax incentives	4.3
• Federal R&D tax incentives	4.6
<b>Finance:</b>	
• Access to capital	4.0
• Cost of capital	3.6
<b>Infrastructure:</b>	
• Access to public R&D facilities	4.0
• Access to university facilities	3.6
<b>Human Resources:</b>	
• Availability of trained senior management	3.8
• Availability of trained production staff	3.7
• Availability of trained specialist staff	3.8
• Availability of professional services	4.9
<b>Other:</b>	
• Public image of aquaculture	1.9
• Federal/provincial cooperation	2.3
• First Nations treaty negotiations	2.1
• Business arrangement with First Nations	4.1

## 5.0 RESEARCH & DEVELOPMENT PRIORITIES

All producers were asked to rank seven R&D priorities in terms of their importance to increasing competitiveness of the BC salmon farming industry.

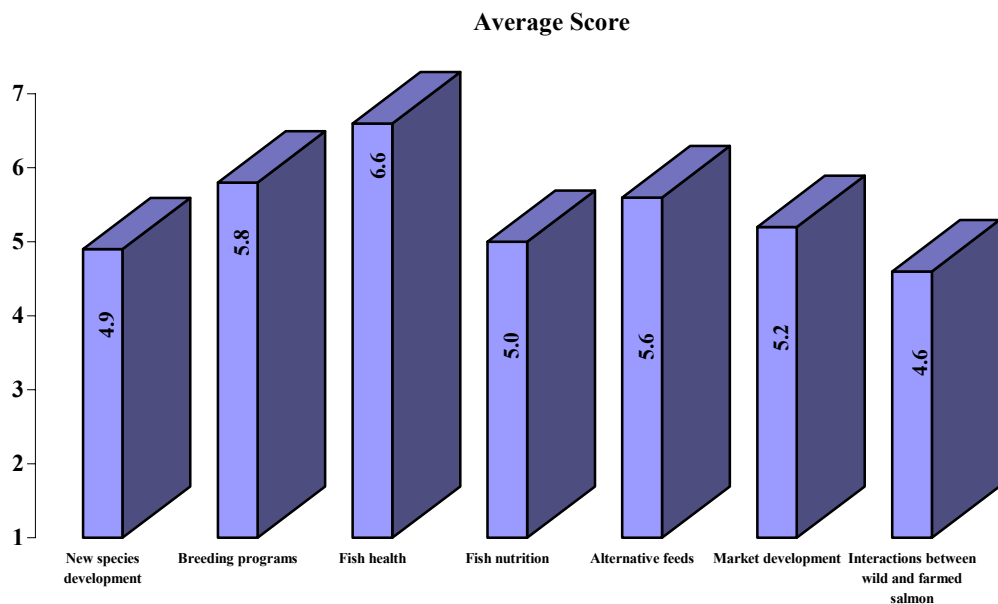
Producers ranked all of the R&D priorities identified as important to increasing competitiveness.

The highest-ranked R&D priority was fish health, followed by breeding programs and alternative feeds. Moderately high rankings were obtained for market development and fish nutrition. The lowest rankings were for interactions between wild and farmed salmon, and new species development. These were ranked lower only because either one or two producers ranked them at the low end of the scale.

The rankings are shown in graphic format in the following Exhibit 3.

### EXHIBIT 3: R&D PRIORITIES

On a scale of 1 to 7, with 7 being the highest score, rank the importance of the following R&D priorities in terms of increasing the competitiveness of the British Columbia salmon farming industry.



Producers were also asked to describe other R&D priorities not listed above which are important to increasing the competitiveness of the British Columbia salmon farming operations. The other priorities identified include the following:

- Food safety of farmed and wild salmon;
- Waste capture and disposal options;
- Non-copper anti-foulant net coatings;
- Break resistant (deforming/stretching) nets;
- Hole/tear alert systems for nets;
- Real time benthic impact monitoring systems (chemical indices);
- Self contained rearing systems;
- Oxygen infusion into sea pens;
- Ozone use in treatment of processing effluent;
- Testing of new stocks (breeding programs);
- Developing new & better inventory control technology (counting devices);
- Develop technology for the utilization of by-products;
- Closed containment salmon culture research and waste removal from these facilities;
- Branding of ecological acceptable cultured salmon for market recognition; and
- Stress and health research related to high density rearing of market salmon.

## 6.0 SUGGESTED PUBLIC POLICY PRIORITIES

All producers were asked to rank public policy priorities in terms of their importance to increasing competitiveness.

Producers ranked six of eight public policy priorities as important to increasing competitiveness.

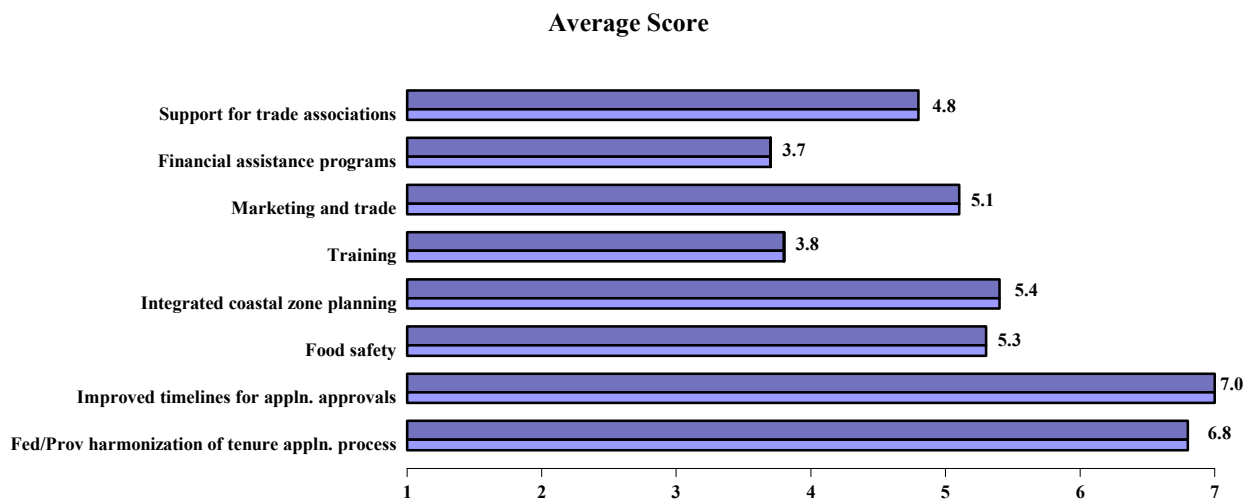
Improved timelines for application approvals ranked as the highest policy priority. It obtained the highest score possible from each of the respondents. Federal/provincial harmonization of the tenure application process ranked very high as well. Integrated coastal zone planning, food safety and marketing and trade ranked moderately high.

Financial assistance programs and training ranked as the lowest priorities.

The rankings are shown in graphic format in Exhibit 4.

### EXHIBIT 4: SUGGESTED POLICY PRIORITIES

On a scale of 1 to 7, with 7 being the highest score, rank the importance of the following policy priorities in terms of increasing the competitiveness of the British Columbia salmon farming industry.



Producers were asked to specify three of the most important ways in which the provincial government can improve the competitiveness of the British Columbia salmon farming industry. Issues identified include the following:

- Promote linkages between wild and farmed salmon sectors;
- Establish a marketing council for both wild and farmed salmon, to develop a BC salmon image;
- Promote simplified CEAA screening reviews as a necessary gain in regulatory efficiency;
- Recognize excellence in salmon farming gains in international competitiveness as well as publicizing compliance shortfalls and numbers of charges;
- Support egg importation;
- Fund research into sea lice, IHN, kudoa;
- Complete a coast-wide land use planning process, and eliminate the possibility of junior governments (Regional Districts and Islands Trust) obstructing Provincial policy on aquaculture development; and
- Improve public awareness and demonstrate support for the industry.

## 7.0 SUMMARY

The survey of producers provides valuable insight into the competitiveness of the BC salmon farming industry. It suggests that the industry is a higher-cost producer than most of its international competition. Reasons for the higher cost structure include logistics, lack of economies of scale in both freshwater and saltwater phases of production and, for some farms, inferior genetic stocks.

While the BC salmon farming producers have a high degree of control over such activities such as breeding programs, production planning and marketing, they exert little or no control over a wide range of factors, such as basic biological conditions and macroeconomic policies dealing with exchange rates.

According to the survey, the main sources of competitive advantage for the industry are proximity to the US market, followed by favourable exchange rates. The latter advantage may be in danger of eroding over time.

Broader-based provincial government policies that relate to labour and tenure rent costs and provincial and federal R&D incentives are contributing to the industry's ability to compete in international markets. The same can be said of business arrangements with First Nations.

On the other hand, the industry is constrained by some government policies related to the environment. Lack of access to new sites is proving to be a particularly difficult problem for producers, even though the moratorium on new sites was lifted in 2002. It is preventing producers from pursuing the economies of scale necessary to be competitive.

Regulatory costs are difficult to measure because in addition to the direct costs associated with compliance, regulations tend to influence other costs, both capital and operating. Compliance issues can also occupy a disproportionate amount of management time and effort.

Despite a high degree of commonality in production practices on a worldwide basis, the BC industry likely faces a heavier regulatory burden than salmon farms in other jurisdictions. In addition, indications are that costs of production in BC are increasing due to regulatory issues.

Producers commented on the regulatory confusion in areas of shared federal/provincial jurisdiction in the saltwater phase and the lack of well-articulated provincial policies for the freshwater phase. These situations come at a time when reducing costs of production are an imperative for industry survival.

Despite a strong export performance and widening consumer acceptance of farmed salmon products in the US, the industry suffers domestically from a poor public image. For the industry to be sustainable in the long term, increased emphasis on developing solutions to new site access and harmonization of the approval process are necessary in order to balance competitiveness against social and environmental objectives. Greater cooperation between the two senior levels of government, industry and other stakeholders is necessary in this regard.

Many of the most important productivity gains in the industry have been technology-based. There is considerable scope for governments to assist the industry in R&D areas, including fish health, breeding programs, alternative feeds and new species development.

**Appendix A Survey Questionnaire**



**British Columbia Salmon Farming Industry**  
**Competitiveness Assessment**

PricewaterhouseCoopers LLP have been engaged by the Ministry of Agriculture, Fisheries & Food (“the Ministry”) to undertake a competitiveness assessment of the British Columbia salmon farming industry.

The purpose of the assessment is to determine areas in which Government can help increase the competitiveness of the industry. The objective of the work is to identify:

- Areas where the British Columbia salmon industry is not competitive and the underlying causes;
- Industry research and development priorities; and
- Suggested provincial policy initiatives.

Accordingly, the Ministry has requested that PricewaterhouseCoopers LLP conduct a confidential survey of salmon farming companies. Attached is a detailed questionnaire that we ask you to respond to no later than January 31, 2003. You may respond to the questionnaire electronically.

All company-specific information from the survey will be kept strictly confidential. Only aggregate information will be presented to the Ministry for publication.

A representative of PricewaterhouseCoopers LLP will be in contact with you to discuss the survey. Enquiries should be directed to:

David Egan, CA, CMC  
PricewaterhouseCoopers LLP  
Tel (604) 806-7538  
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**Part A Comparative Costs of Production**

- Using 100 as a base index for British Columbia, compare your company’s salmon farming production costs in the province to other regions where your company and its affiliates also farm salmon.

**Example:**

An example of how this question should be answered is shown below. Note that the totals for comparative regions need not add up to 100.

	BC	Region A	Region B
Smolts	15	14	14
Feed	35	36	38
Labour	12	14	16
Processing	15	14	18
Depreciation	5	4	4
Transport to market	10	9	8
Other	8	6	6
<b>Total</b>	<b>100</b>	<b>97</b>	<b>104</b>

**Comparative Costs Of Production In Salmon Farming**

	BC	NB	Norway	Chile	UK	Other ( )	Other ( )
Smolts							
Feed							
Labour							
Processing							
Depreciation							
Transport to market							
Other							
<b>Total</b>	<b>100</b>						

2. Explain why salmon farming production costs in British Columbia may be significantly higher or lower than in other regions. You may answer this question even if your company only operates in the province.

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## Part B Relative Importance of Business Factors

3. In the current British Columbia business climate, on a scale of 1 to 7, rank the extent to which the following are contributing (7) or impeding (1) your company's ability to compete in international markets. *Indicate your responses with an 'X'.*

	1	2	3	4	5	6	7
Current economies of scale							
Proximity to markets							
Canadian/US dollar exchange rate							

### **Provincial Regulations**

Regulations regarding marine sites:

- Costs of new tenure application process
- Timeline for application approvals
- Tenure rent costs
- On-going costs of compliance for approved tenures


Regulations regarding freshwater sites:

- Costs of new site application process
- Timeline for application approvals
- Tenure rent costs (if applicable)
- On-going costs of compliance for approved sites


Regulations regarding processing

Regulations regarding labour


### **Federal Regulations**

Regulations regarding marine tenures:

- Costs of new site application process
- Timeline for application approvals
- On-going costs of compliance for approved sites


Regulations related to introductions and transfers

Regulations regarding processing

International trade support


### **Taxation Policy**

Corporate taxation

Personal taxation

Provincial R&D tax incentives

Federal R&D tax incentives


**Finance**

- Access to capital
- Cost of capital

1	2	3	4	5	6	7

**Infrastructure**

- Access to public R&D facilities
- Access to university facilities


**Human Resources**

- Availability of trained senior management
- Availability of trained production staff
- Availability of trained specialist staff
- Availability of professional services


**Other**

- Public image of aquaculture
- Federal/provincial cooperation
- First Nations treaty negotiations
- Business arrangement with First Nations


4a. On a scale of 1 to 7, with 7 being the highest score, rank the importance of the following R&D priorities in terms of increasing the competitiveness of the British Columbia salmon farming industry. *Indicate your responses with an 'X'.*

- New species development
- Breeding programs
- Fish health
- Fish Nutrition
- Alternative feeds
- Market development
- Interactions between wild and farmed salmon

1	2	3	4	5	6	7

4b. Are there R&D priorities not listed above which you feel are important to increasing the competitiveness of your British Columbia salmon farming operations? Describe these.

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5. On a scale of 1 to 7, with 7 being the highest score, rank the importance of the following policy priorities in terms of increasing the competitiveness of the British Columbia salmon farming industry. *Indicate your responses with an 'X'.*

Federal/Provincial harmonization of tenure application process  
 Improved timeline for application approvals  
 Food safety  
 Integrated coastal zone planning  
 Training  
 Marketing and trade  
 Financial assistance programs  
 Support for trade associations

	1	2	3	4	5	6	7

6. Specify three of the most important ways in which the provincial government can improve the competitiveness of the British Columbia salmon farming industry.

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Thank you.

## **Appendix B Responding Companies**

### **Major Farms**

Marine Harvest Canada  
Stolt Sea Farm Inc.  
Omega Salmon Group Ltd.  
Pacific National Aquaculture  
Heritage Salmon Ltd.

### **Other Farms**

Grieg Seafoods BC Ltd.  
Target Marine Products Ltd.  
Creative Salmon Company Ltd.  
Agrimarine Industries Inc.

## Appendix C Selected Comments

“The biggest problem in the past year has been a lack of harmonization between the two governments. It used to be that the Province was more difficult to deal with but that has changed. The Province now has a more business-like attitude with small pockets of entrenched civil servants as exceptions. Now the Feds are much more difficult to deal with. There is a whole new attitude there that doesn’t care about business, time, or money.”

“We believe that world salmon markets are increasingly becoming a commodity market where individual suppliers will simply be price-takers. It is very difficult now to differentiate one salmon product from another and increasingly users are shopping price. New species will be important as producers try to find increased margins for their products.”

“The government must work to harmonize regulatory bodies so that producers can operate on a level playing field – NOT at the whim of the bureaucrat of the week who chooses to interpret some regulation in a different way. We are currently being hit with this sort of thing.”

“The government must provide access and encouragement for companies to develop alternate species. Financial margins will be difficult in salmon markets in the years to come.”

“The government must come out and support this industry. Special interest groups have all but killed off resource jobs in coastal communities. We are one of the few job creators out there. Special interest groups must be held to account.”