

## Biotechnology Revenues in Canada and U.S.

The biotechnology industry is maturing fast. It is now earning major gains for the countries which are ahead in innovation in this technology. Both Canada and U.S. are playing significant role in the development of biotechnology.

In Canada, overall 252 out of 375 or 67 per cent of innovative firms reported biotechnology revenues in 2001. These firms come from all categories: small (175), medium (41), and large (36). Thus, two thirds of both small and medium-sized firms earned revenues from their biotechnology activities in 2001. This figure was 78 per cent for large firms. In absolute terms, the number of firms reporting biotechnology revenues was greater than in both 1997, (176), and in 1999, (225). This suggests that over the years, in all firm categories, a larger number of firms were able to bring biotechnology products onto the market.

About 46 per cent of the firms declaring biotechnology revenues in 2001 came from human health (Table 1). The agriculture and food processing sectors followed with 54 and 34 firms, respectively. Twenty-

**Table1: Number of Innovative firms declaring Biotech Revenue in Canada – 2001 (in millions)**

Sector	Biotech of Innovative Firms Declaring Biotech Revenues	Number of Innovative Firms Declaring revenues
Human Health	115	137
Agriculture Biotechnology	54	58
Natural Resources	9	9
Environment	27	31
Aquaculture	8	9
Bioinformatics	6	6
Food Processing	34	38
<b>Total</b>	<b>252</b>	<b>288</b>

Source: *Statistics Canada*, Biotechnology Use and Development Survey-2001, Preliminary data.

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seven of the firms in the field of Environment reported biotechnology revenues in 2001. Together, the natural resources sector, the aquaculture sector, and the bioinformatics sector accounted for 23 of the 252 biotechnology income earning firms.

The health sector has the highest number of firms (137) reporting revenue gains. Agriculture, food processing, and environment are other revenue earning sectors. Together, they account for 127 firms.

The biotechnology firms in the human health sector are making more revenue than other firms. The food processing industry followed with \$581 million, the environment sector with \$268 million and agriculture with \$246 million. Although agriculture sector comes second in terms of number of biotechnology revenue earning firms, it lies fourth in terms of revenue; this implies that firms in this sector earn less revenue from their biotechnology activities. The reverse takes place in aquaculture and bioinformatics as far as revenue generation (Table 2).

According to Critical Technology Assessment Survey, US (2003), the net sales were high in animal health with the sale average of \$124 million, human health comes second with \$65 million and then comes marine and terrestrial microbial, and agricultural derived processing comes with \$61 and \$52 million as a net sales average respectively (Table 3). From the survey, in 2001 the US had annual net sale of around \$567 billion with operating income of \$100.5 billion. As per the report, the R&D expenditures of \$41.6 billion with capital expenditures rises up to more then \$29 billion in biotech sector (Table 4).

**Table 2: Biotech Revenue and Total Revenues by Sector in Canada, 2001**

Sector	(in million)	
	Total Revenues	Biotech Revenues
Human Health	5074	2461
Agriculture Biotechnology	8666	245
Natural Resources	64	7
Environment	8900	268
Aquaculture	27	5
Bioinformatics	3	2
Food Processing	4332	581
<b>Total</b>	<b>3569</b>	<b>3569</b>

Source: *Statistics Canada*, Biotechnology Use and Development Survey-2001, Preliminary data.

**Table 3: Average Financial Performance of Biotechnology Business in US (2001)**

Sector	Net Sales Avg. in (\$thousand)	Operating Income Avg. in (\$ thousand)
Human Health	65326	12876
Aquaculture/Marine	28,341	-730
Animal Health	124,025	37,227
Industrial and Agricultural processing	52,504	5,557
Marine and Terrestrial Microbial	61347	7,700
Environmental Remediation and Natural Resource recovery	30541	2876
Others	23308	2876
Total		

Source: U.S Department of Commerce technology Administration and Bureau of Industry and Security, *Critical Technology Assessment of Biotechnology in U.S. Industry*, August 2002.

**Table 4: Financial Data for total and Biotech Business, in US-2001 (in millions)**

	Biotech	Biotech /Total (%)	Total
Net Sales	50472	8.9	566,985
Operating Income	9367	9.3	100,516
Capital Expenditures	6,244,	21.1	29535
R&D Expenditures	16440	39.5	41590

Source: U.S Department of Commerce technology Administration and Bureau of Industry and Security, *Critical Technology Assessment of Biotechnology in U.S. Industry*, August 2002.

Analysis of data based on firm size reveals that in addition to differences in sources of revenue for smaller and larger respondents, there are differences in the way companies engaged in biotechnology spend their revenues. For example, companies reporting 500 or fewer employees accounted for 13.5 per cent of total reported biotechnology net sales but they had a disproportionately large share of total capital expenditures (26.7 per cent) and R&D expenditures (34.4 per cent), compared to their larger counterparts.

Based on responses to the *Critical Technology Assessment* survey, it appears that the magnitude of US-based firms that are working in biotechnology research, development, and applications is substantial. When describing their entire business operations, survey respondents reported: overall 2001 annual net sales of around \$567 billion, operating income of \$100.5 billion, capital expenditure of \$29.5 billion, and R&D

**Table 5: Financial Performance by Firm Size in US-2001 (\$ million)**

Biotechnology Business	1-10	11-50	51-500	501-2500	2501-15000	>15000	Total
Net sales	0.74	1.02	11.75	20.72	30.64	35.13	100
Cost of Good Sold (COGS)	1.74	1.83	20.23	25.45	27.27	23.48	100
Operating Income	-1.23	-5.55	-16.07	21.73	39.47	61.64	100
Total Capital	0.20	4.93	21.55	16.17	22.53	34.62	100
R&D Expenditures	0.99	5.40	28.05	21.67	21.71	21.16	100

Source: U.S. Department of Commerce technology Administration and Bureau of Industry and Security, *Critical Technology Assessment of Biotechnology in U.S. Industry*, August 2002.

expenditures of \$41.6 billion. On an aggregate basis companies' biotechnology-related undertakings appear to be only a fraction of their overall business activities accounting for 9 per cent of net sales, 9 per cent of operating income, and 21 per cent of capital investment, their R&D expenditures for biotech business lines accounted for almost 40 per cent of total reported R&D expenditures (Table 5).

## References

- McNiven, Chuck. 2003. 'Features of Canadian Biotechnology Innovative Firms: Results from the Biotechnology Use and Development Survey – 2001'. Statistics Canada, March.
- USDC. 2003. 'A Survey of the Use of Biotechnology in U. S. Industry'. U.S. Department of Commerce, USA, October.