A photograph of a person fishing in a shallow, rocky stream. The water is clear, and the rocks are visible at the bottom. The person is in the center, casting a net. The background shows a forested area. The entire image is framed by a thick blue border.

**Feeding the family
in times of change;
contaminants & development options**

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**Panel D: Determinants of success & failure in northern
economies**

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Feeding the family in times of change

1. Country food use and value
2. Change...contaminants...comprehension
3. Economic interests & options
4. Research and policy needs

1. Country food use & values

- Strong in some communities, weaker in others
- Change influences:
 - Colonialism
 - Economic integration
 - Contaminants
 - Environmental change
 - Development/conservation decisions

Food security

Accessible

Acceptable

Affordable

Nutritious

Country foods remain important, despite socioeconomic changes

Country food production

- 10% of labour income
- 80% native households involved
- \$10-15,000 value in food, materials (Usher, 1989)

- \$15-17,000 per household per year in the Arctic; \$6-9,000 in the Subarctic (Berkes and Fast 1996).

- 73-79% of Nunavut Inuit males in 1999
- 60% of NWT Inuit and Inuvialuit in 1998 (Conference Board of Canada 2002)

- \$30-50M per year replacement value in Nunavut (Conference Board of Canada 2002)
- Overall in Canada, the traditional harvest value was one third that of the entire cash economy, exceeding the income from any other single source (Berkes et al. 1994)

Country food is more nutritious:

- $>1/2$ of protein consumed is from this source
- $1/3$ of food energy
- omega-3 fatty acids, key vitamins and minerals
- more iron, zinc, magnesium, vitamin A and copper


Imported foods (affordable ones):


- high in refined carbohydrates, fats, sugars and salt
- low in vitamins, fibre and protein
- more calcium

- On the days that country foods are eaten, northerners' diets are high in various vitamins and minerals, as well as protein.
- ... On days that imported foods are eaten, their diets are high in sucrose, fats and carbohydrates (Kuhnlein & Receveur, 2003)

2. Change... contaminants... comprehension

Centralized settlements	Harvesting as part of mixed economy
Mechanized transport	Access to market foods
Individualized hunting	Hydro development, mining, oil & gas
Commercialization of resources	Need for sustainable economic options
De-commercialization of resources	New knowledge about contaminants
Involvement in formal economy jobs	Climate change

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- Less fish, less marine mammals, more caribou/land animals
 - Decline of dog teams and fur trade
 - Human food production increased

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- *benefits* - nutrition, taste, social and cultural values, health effects, educational benefits of being on the land, economic considerations
 - *risks* - uncertain health effects
 - health advisories balance risks and benefits; and risks of *not* eating C.F.

Community comprehension:

- Mixed messages
- Uncertainty
- Regional differences
- Age, gender effects

Hunters, elders, women differ:

Uncertain about concept, exposure, effects

Barriers to communication

- Scientific uncertainty
- Western/traditional divide; invisible/visible
- Terminology / interpretation
- Cultural commitment to C.F.
- Lack of options
- Risk evaluation
- Issue overload
- Personnel turnover
- Intergenerational communication/training

Socio-economic impacts

- faith in environment / wildlife integrity
- hunters' roles in community / society
- elders' dependence on C.F.
- income from harvest
- food for communities
- “the future”



Country food remains important

Subsistence harvesting

Little alternative wage work/ cash income

Encouraged in government policy

Bathurst Mandate: “build on strengths”

Arts & crafts, tourism, harvesting

Harvesting for: subsistence, local markets,
community hunts, larger-scale commercial

3. Economic interests & options

- Uncertainty about future harvest rates:
 - Youth less involved in subsistence....?
 - Employment may increase / decrease harvesting
 - Sustainable harvest levels?
- Desire for commercial fisheries
- Existing commercial fish plants
 - char, shrimp, scallops, clams

- Char: 2001, 90 tonnes landed
 - 200 operators and hired hands
- Turbot: 5000 tonnes quota -> Nunavut
 - 2500 tonnes to company quotas
 - 1500 tonnes to southern companies
- Shrimp: 17 offshore licences, mostly non-Nunavut
- Clams: 55,000 kg quota/yr - <10% taken
 - no export possible w/o inspection

Value of marine harvest

		GDP (\$M)	Employ- ment (PYs)	Income (\$M)
<i>Commercial Fisheries</i>	Nunavut	\$8	140	\$3.5
<i>Arts and Crafts</i>	NWT	\$1.6	30	\$1.2
	Nunavut	\$12	200	\$10
<i>Sports hunts/fishing</i>	NWT	\$1	10	\$0.6
	Nunavut	\$3.4	55	\$2.0

Obstacles & needs for resource development

- remoteness
 - weather and environmental conditions
 - expensive technology and related training needs
 - expensive transportation
 - quota regulations
 - limited knowledge of Arctic fishery potentials
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- clear procedures for issuing licences, deciding quotas
 - including TEK in setting quotas and complementing scientific stock assessment numbers

NRF questions:

Northern food economies

- flexible (☞); adaptable (☞)
- sustainable (☞/?); viable (☞/?)

Indicators of relative health

- persistence
- demand
- nutrition

“Factors promoting success”: information / management needs for fishery development

Better research, information, certainty

- *harvesting data, inventories, quotas and regulations; better communications (comprehension and needs)*

Infrastructure & support

- *adequate ports, harbours & processing plants; improved transportation/access; exploratory fisheries; fairer distribution of fishing licences; more visible DFO staff*

Environmental evaluation

- *climate change implications; wildlife health; waste & sewage management, health implications for some stocks (e.g., clams); human health impacts*

Assessment of the industrial impact

- *trawlers and the turbot fishery in Cumberland Sound*

4. Research & policy needs

- *the nature of changes in country food consumption - costs, benefits, opportunities*
- *elements that should be included in the risk-benefit approach to contaminants in country food*
- *sustainable, culturally appropriate economic options (formal and informal) based on the land and country foods, northern resources and values*
- *new ways to anticipate and deal with change and surprise; better ways to communicate*