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Section B

Health Implications of Aquaculture
Science and Aquaculture

- Biomedical science has not kept pace with the rapid increase in aquaculture production
- Government and industry have no incentive to study health consequences of practices
- Potential pathways identified
- Paucity of epidemiological evidence
Occupational Hazards in Aquaculture

- Dangerous physical environment
  - Musculoskeletal injuries
  - Drownings, diving accidents
  - Exposure to harmful chemicals
  - Exposure to bacteria and trematodes
Consumer Health Risks

- Exposure to antibiotics
  - Applied in water, aquafeeds
  - Prophylactic use
  - Remains in environment
  - Similar problems to farm animal agriculture misuse

Consumer Health Risks

- Exposure to heavy metals
  - Levels depend on aquafeeds used
  - High levels when animal agriculture waste used in ponds
  - Lead, cadmium, zinc, copper, methyl mercury

Sources: Andreji et al. (2006); Sutherland et al. (2007); Hâstein et al. (2006).
Environmental Concerns

- Effluent discharge from either open systems or closed systems without adequate treatment
  - Eutrophication
  - Toxic algae blooms
  - Antibiotic residue
  - Pollution to downstream consumers
  - Diseases
Environmental Concerns

- Excess feed and oil accumulates in water
  - Attracts wild fish: disease
  - Attracts natural predators: mortality
  - Attracts wild fowl: avian influenza
Environmental Concerns

- Escapees from fish pens
  - Decrease fitness of wild stock
  - Outcompetes indigenous species
Environmental Concerns

- Poor land/coastal management
  - Clearing of mangrove areas for aquaculture, leaving coastal areas more vulnerable to tidal surges
  - Water diversion interfering with flood mitigation

*Image source: Jose Aguilar Manjarrez, FAO. Retrieved from www.irc-online.org/images/irc/391.jpg*
Potential Solutions

- Improved regulations for aquaculture
  - Restrict use of chemicals and veterinary drugs
  - Develop vaccines
  - Restrict effluent discharge
Potential Solutions

- Better stewardship of wild fisheries
  - Restriction of overfishing
  - Reduction of bycatch
  - “Ranching”
Conclusion

- Do benefits of improved diet and food security outweigh harmful aspects of industrial aquaculture?
- Processes by which adverse aquaculture practices can be detrimental to human health are well documented
- More research needed for epidemiology on specific outcomes