

North Central Region Aquaculture Producer Opinion Survey

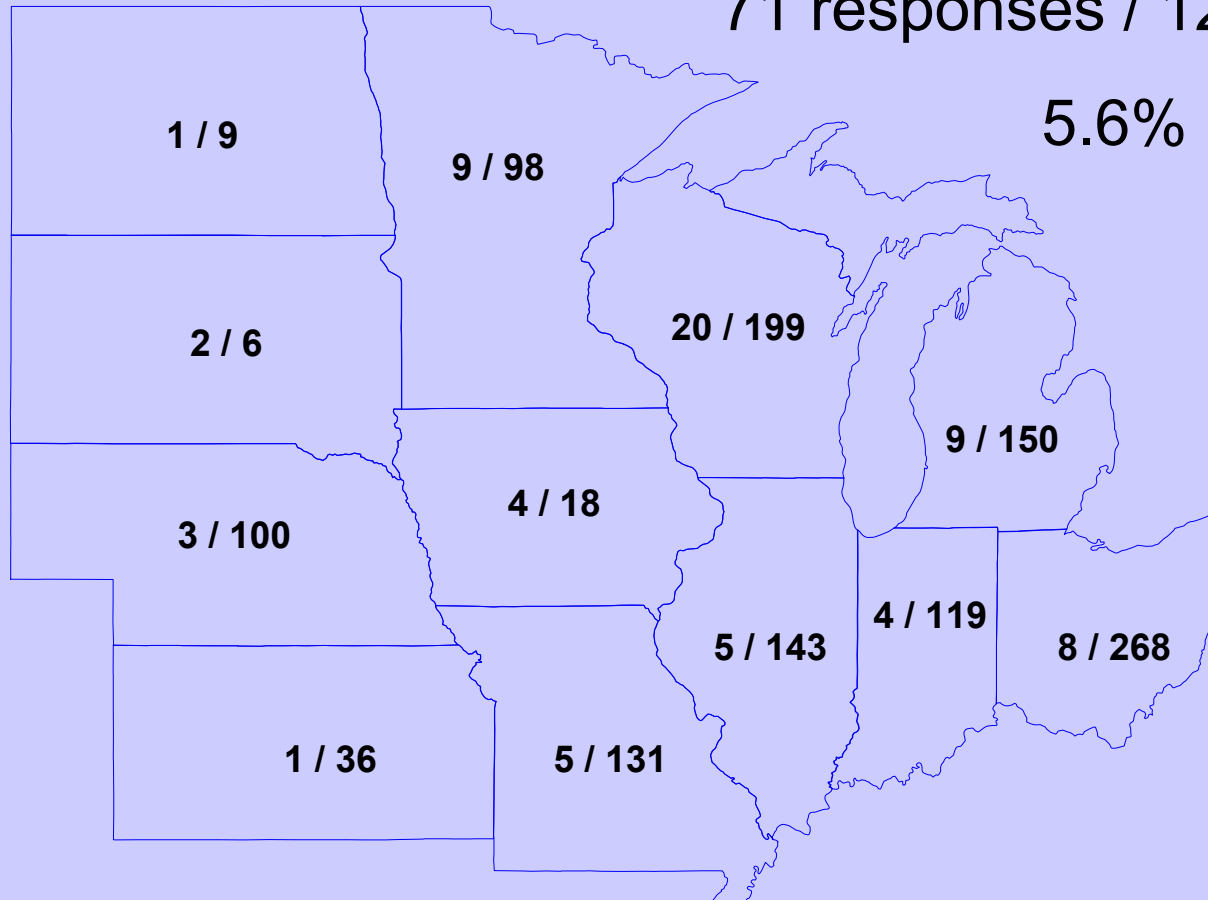
Preliminary Results prepared by the AREF and
presented to the NCRAC Industry Advisory Council
February 11, 2005

Objectives:

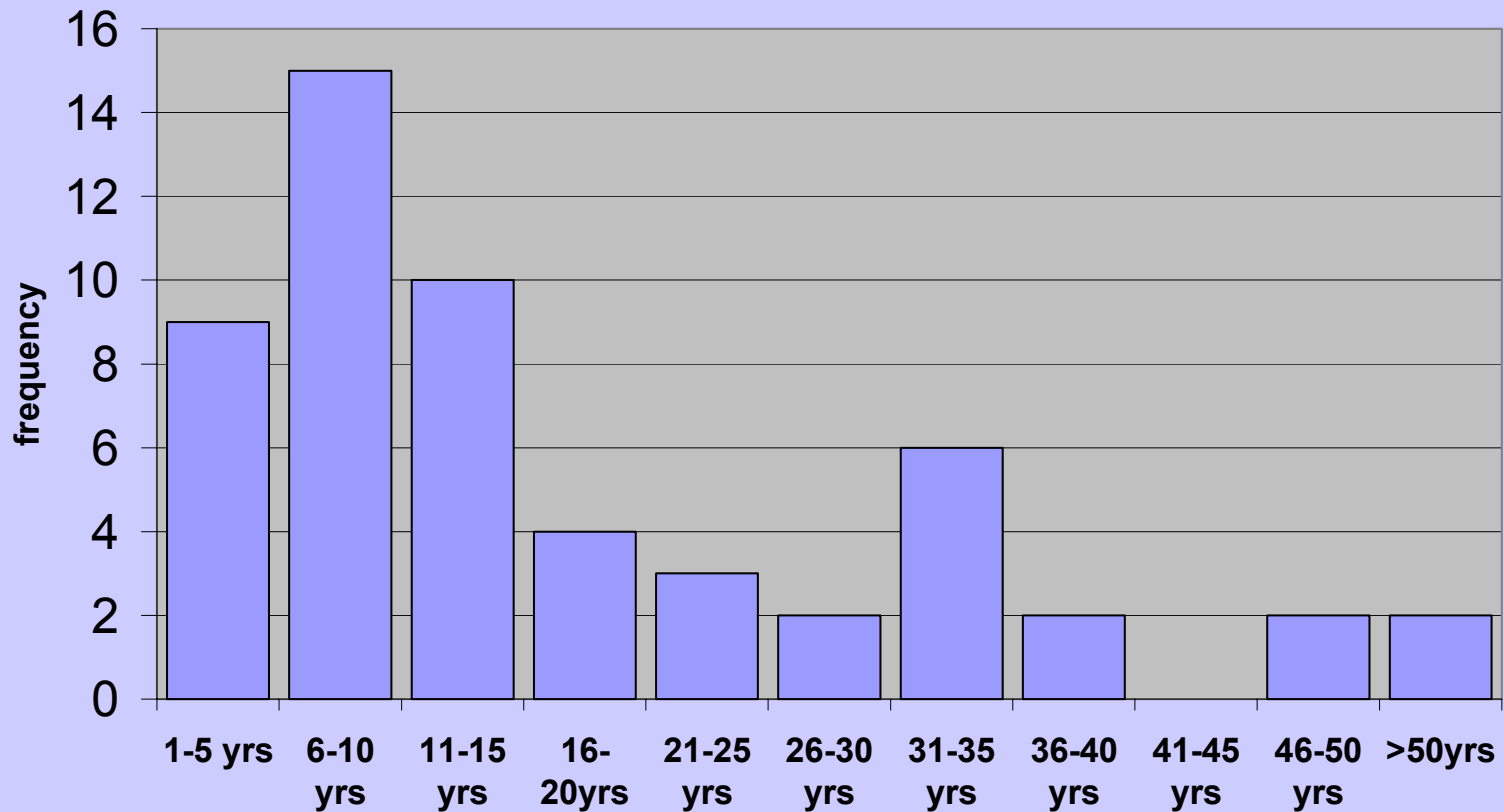
- “To obtain the most current information on the NCR aquaculture industry needs.” In December 2004 an opinion survey questionnaire was mailed to >1277 regional producers.
- To broaden the assessment of industry needs to include a larger representative group of producers, beyond the IAC membership alone, we compiled lists of known regional producers using the NCRAC database, web based- state association lists and state producer lists.

Regional Distribution and Response to Aquaculture Producer Opinion Survey

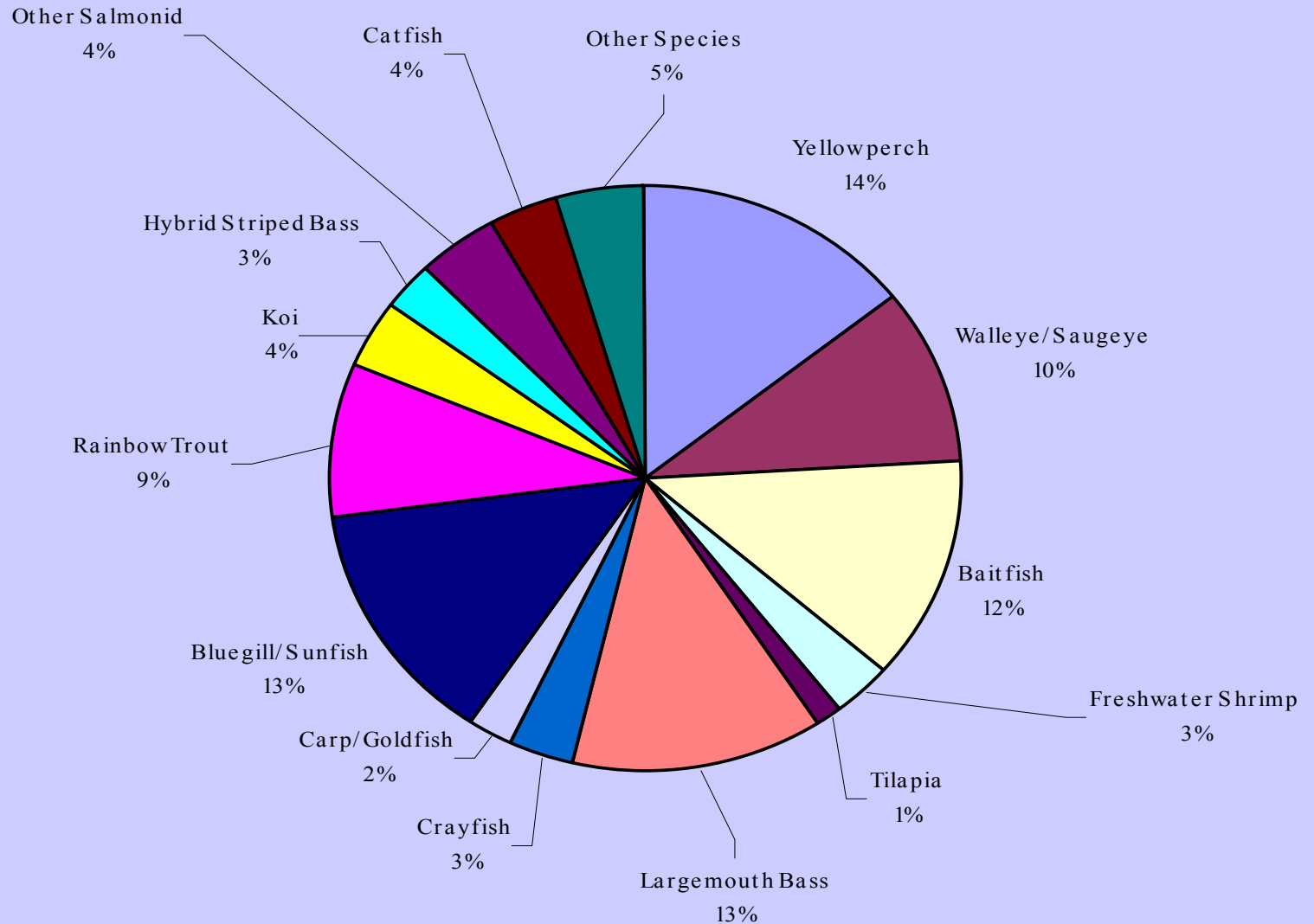
71 responses / 1277 mailed



Producer's Reported Years of Aquaculture Operation



Species reported as raised by responding producers

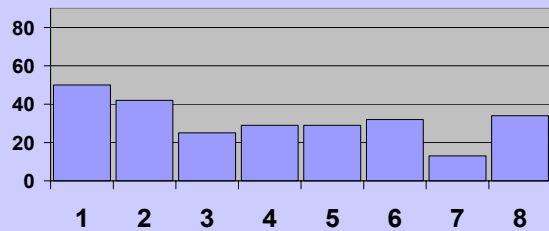


1. What are the major constraints on profitable regional aquaculture development?

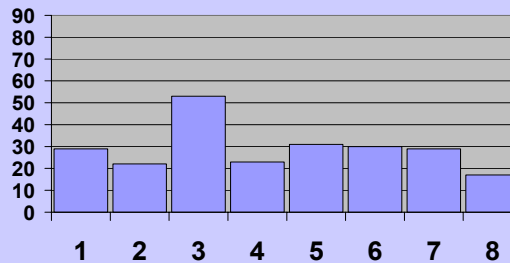
- Lack of cost effective rearing technology.
- Lack of adequate markets for products.
- Competition from wild caught fisheries
- Competition from domestic or imported products.
- Lack of land and water resources
- Government regulatory constraints.
- Lack of investment opportunities.
- Other?

1. What are the major constraints on profitable regional aquaculture development (general)?

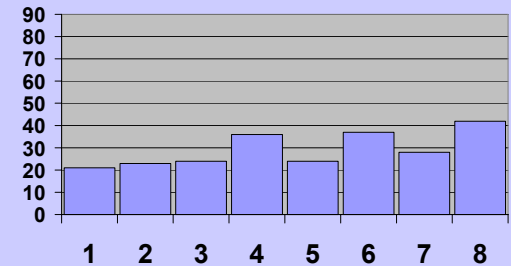
Lack of cost effective rearing technology.



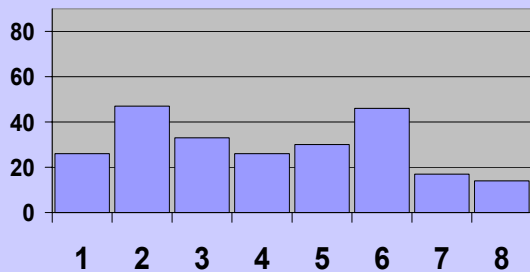
Lack of adequate markets for products.



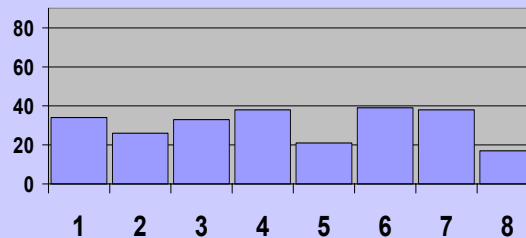
Competition from wild caught fisheries.



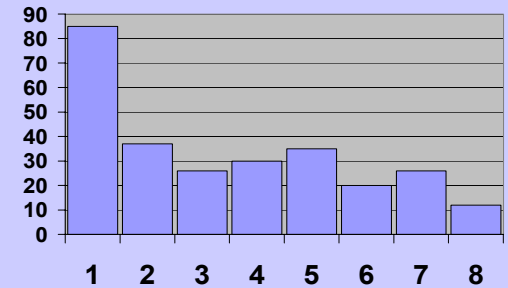
Competition from domestic or imported products.



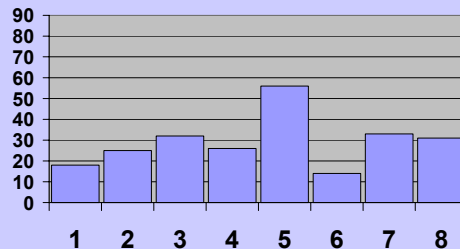
Lack of land and water resources.



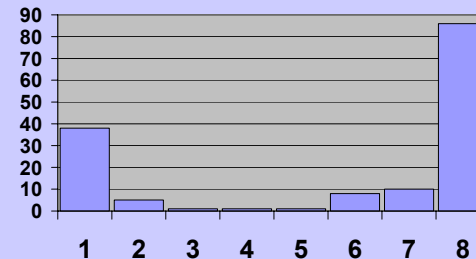
Government regulatory constraints.



Lack of investment opportunities.

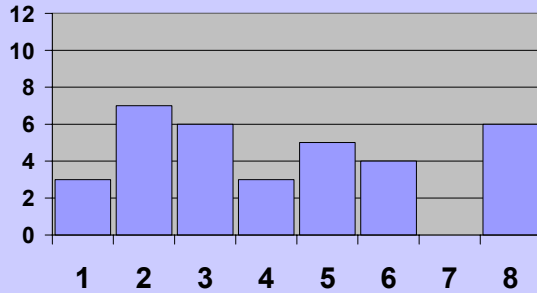


Other?

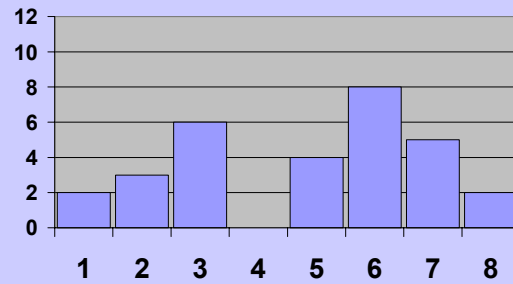


1a. Major constraints on profitable NCR Baitfish aquaculture development?

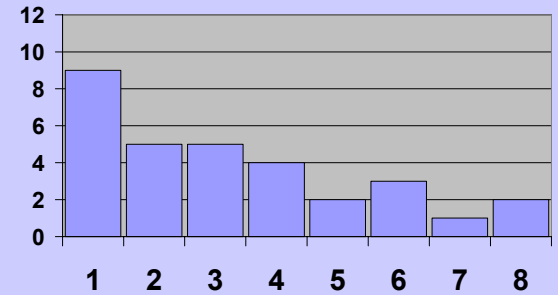
Lack of cost effective rearing technology.



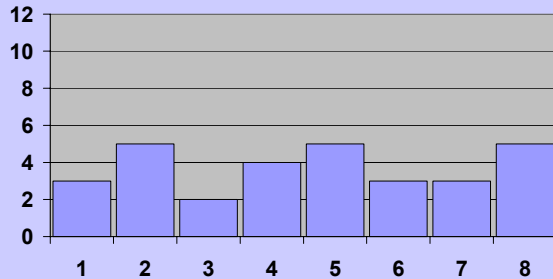
Lack of adequate markets for products.



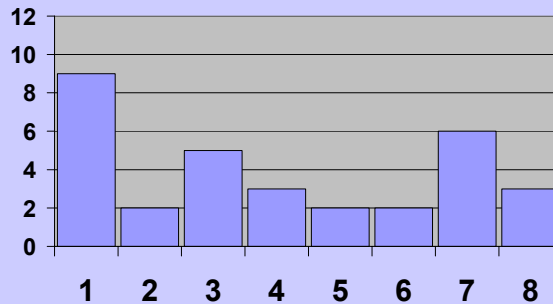
Competition from wild caught fisheries.



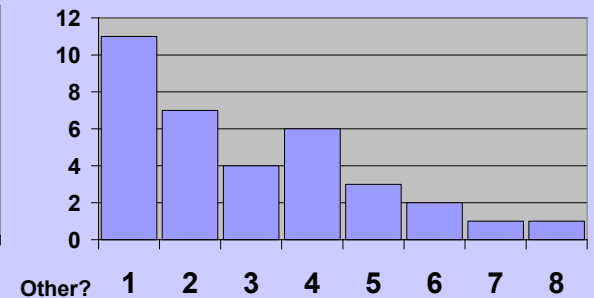
Competition from domestic or imported products.



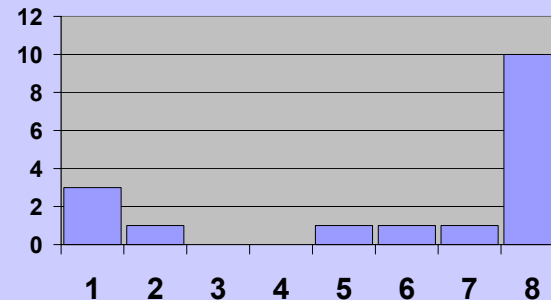
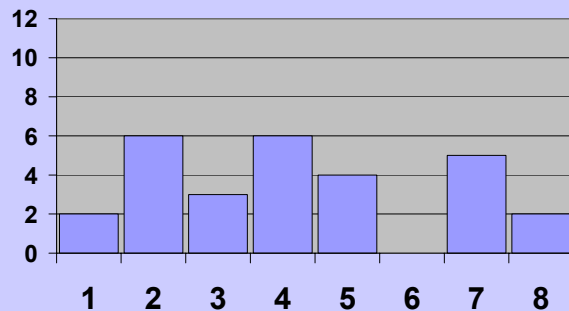
Lack of land and water resources.



Government regulatory constraints.

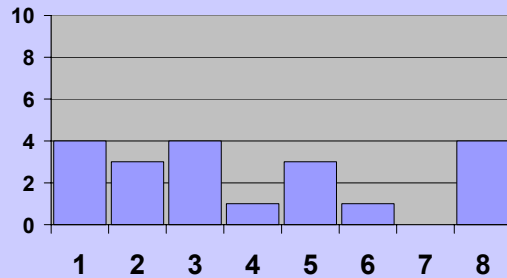


Lack of investment opportunities.

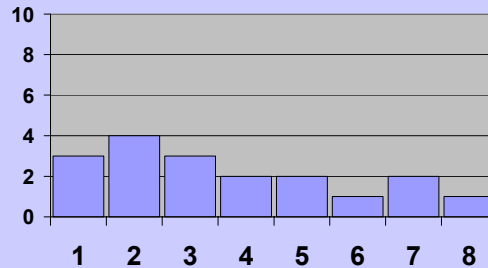


1b. Major Constraints on profitable NCR Hybrid Striped Bass aquaculture?

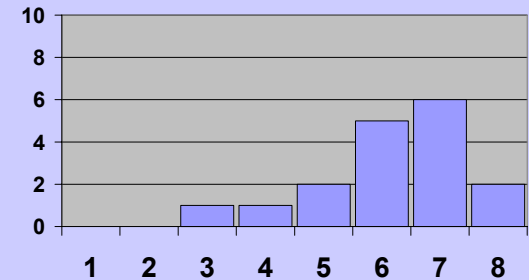
Lack of cost effective rearing technology



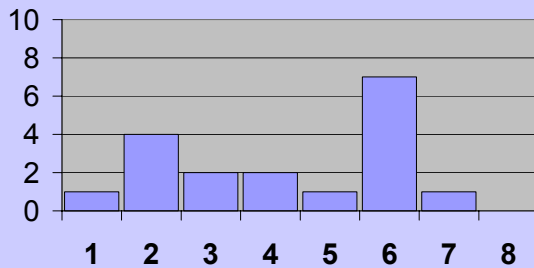
Lack of adequate markets for products.



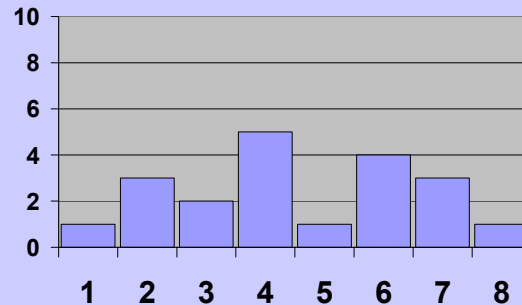
Competition from wild caught fisheries.



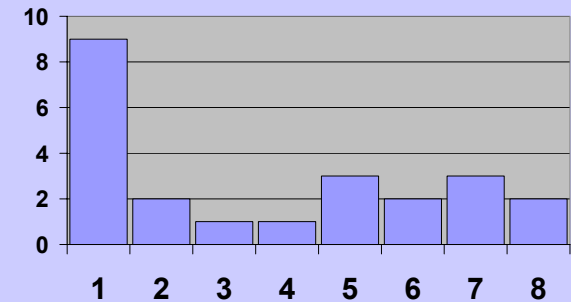
Competition from domestic or imported products.



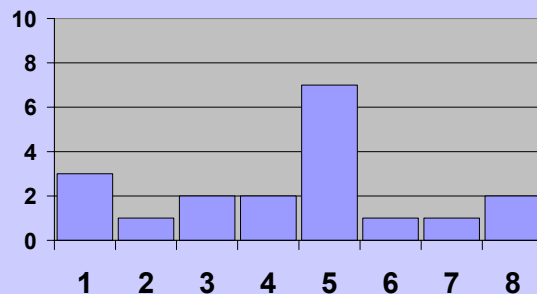
Lack of land and water resources.



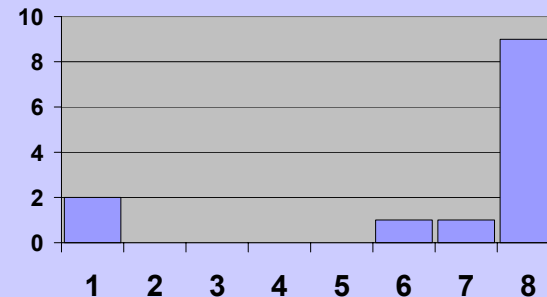
Government regulatory constraints.



Lack of investment opportunities.

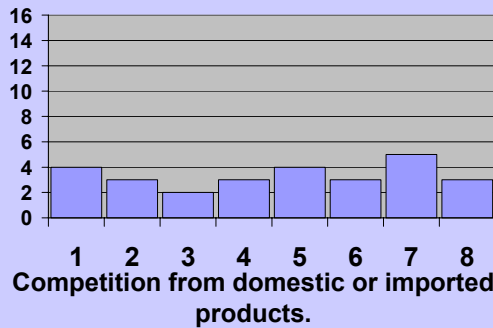


Other?

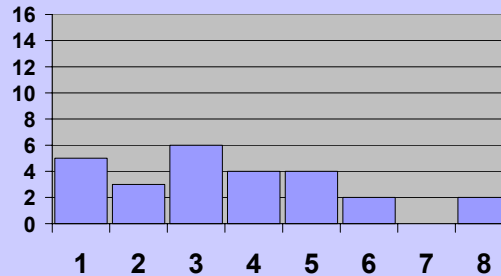


1c. Major constraints on profitable NCR Salmonid aquaculture development?

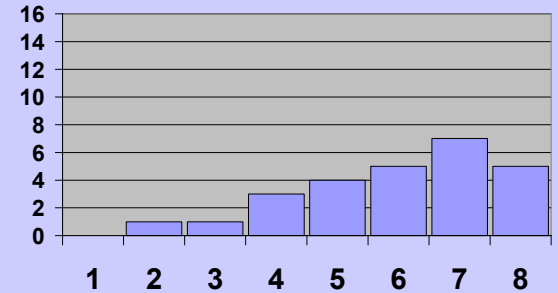
Lack of cost effective rearing technology.



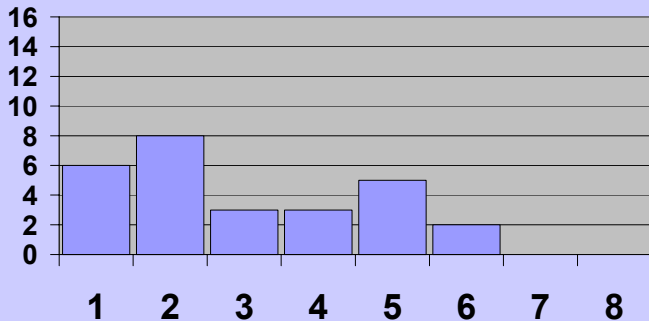
Lack of adequate markets for products.



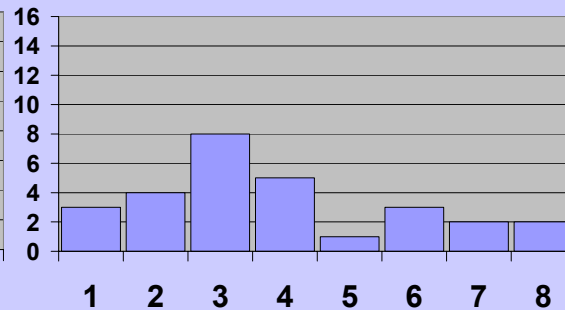
Competition from wild caught fisheries.



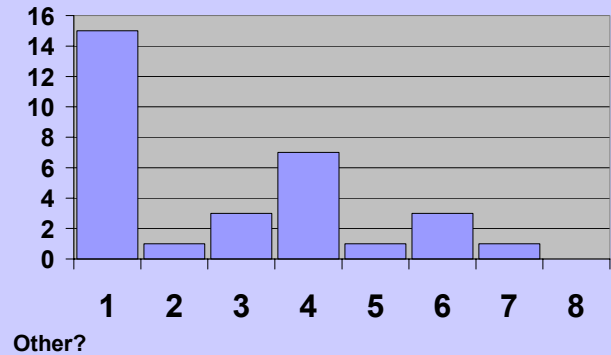
Competition from domestic or imported products.



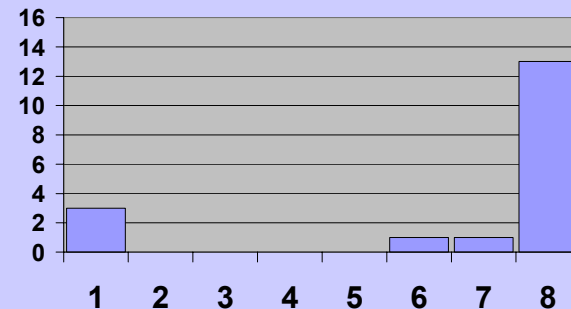
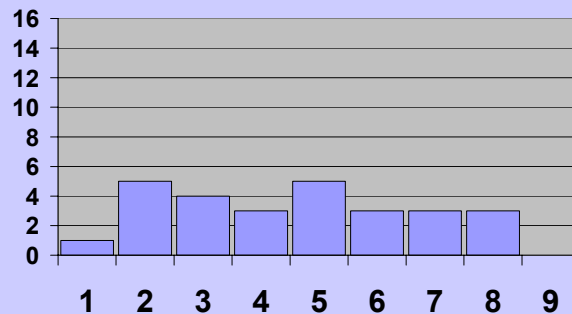
Lack of land and water resources.



Government regulatory constraints.

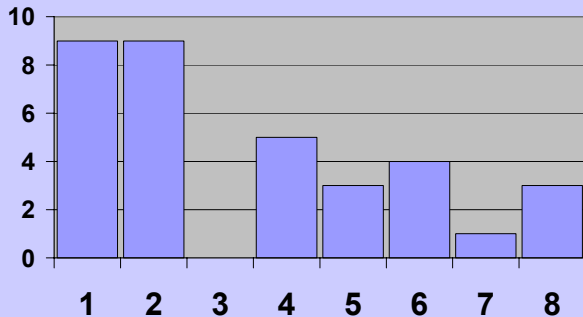


Lack of investment opportunities.

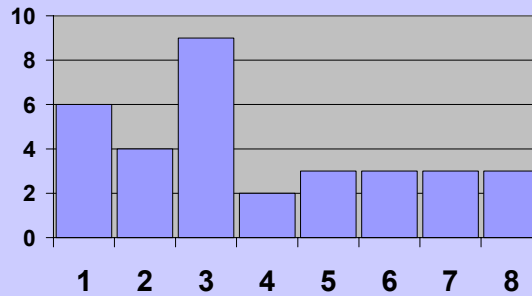


1d. Major constraints on profitable NCR Sunfish aquaculture development?

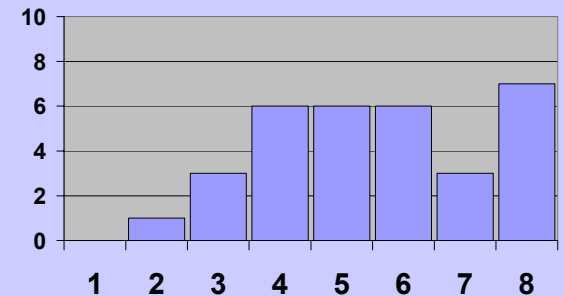
Lack of cost effective rearing technology.



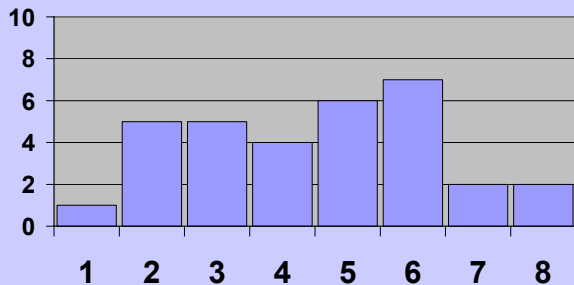
Lack of adequate markets for products.



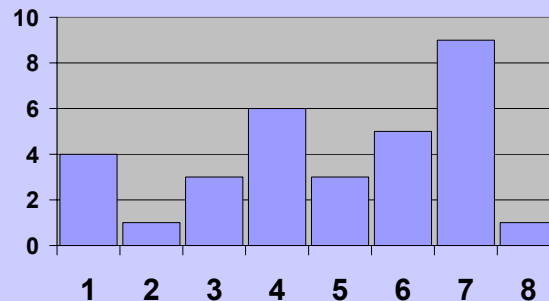
Competition from wild caught fisheries.



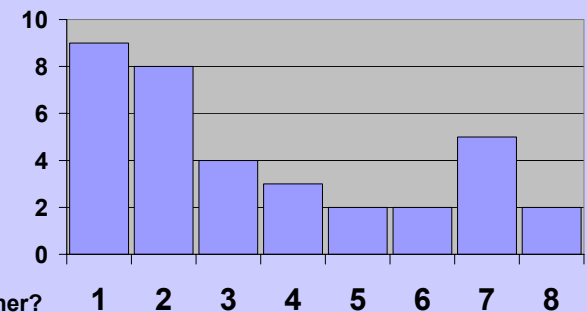
Competition from domestic or imported products.



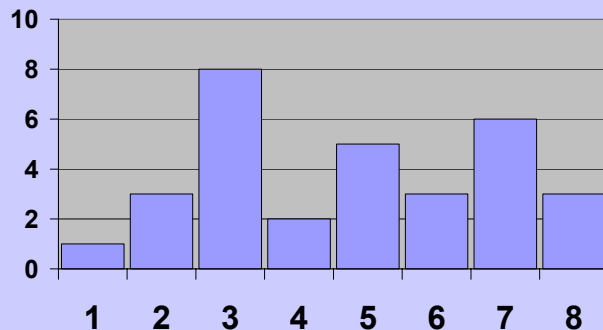
Lack of land and water resources.



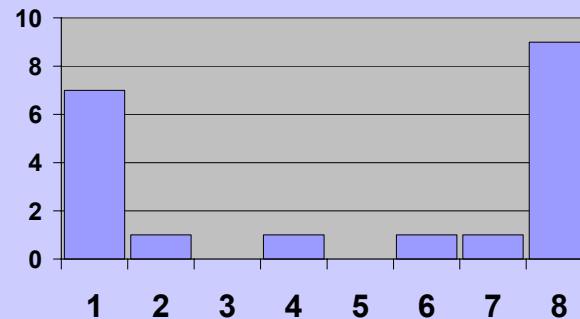
Government regulatory constraints.



Lack of investment opportunities.

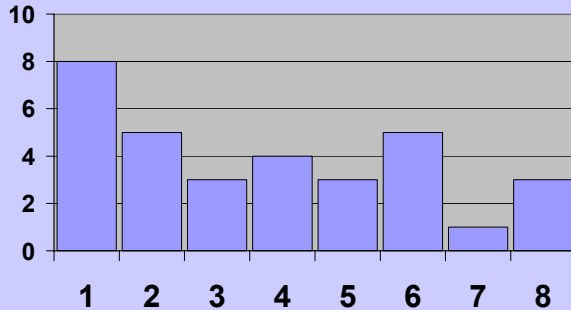


Other?

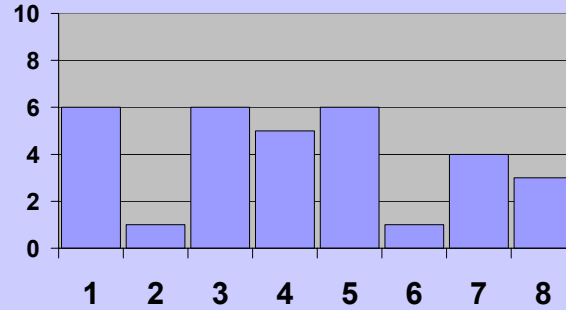


1e. Major constraints on profitable NCR Largemouth Bass aquaculture development?

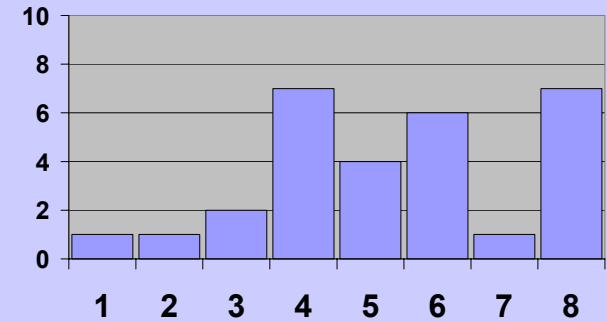
Lack of cost effective rearing technology.



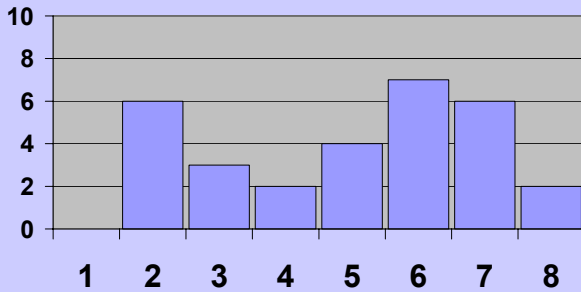
Lack of adequate markets for products



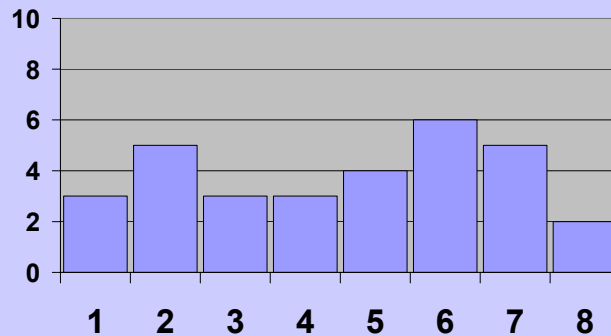
Competition from wild caught fisheries.



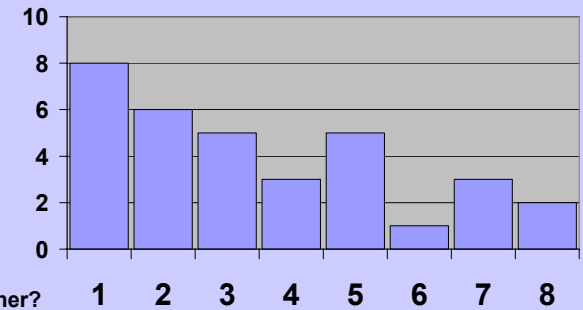
Competition from domestic or imported products.



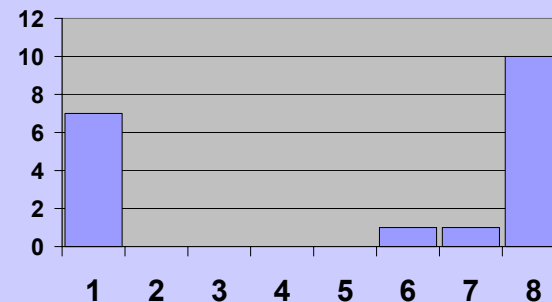
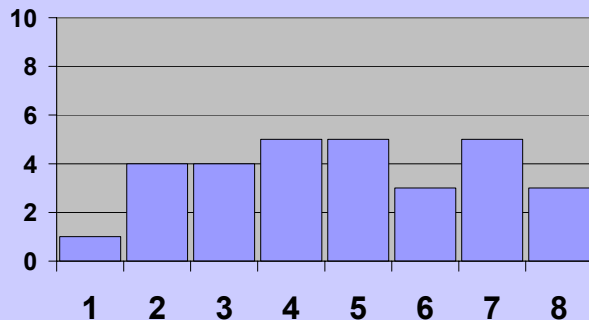
Lack of land and water resources.



Government regulatory constraints.

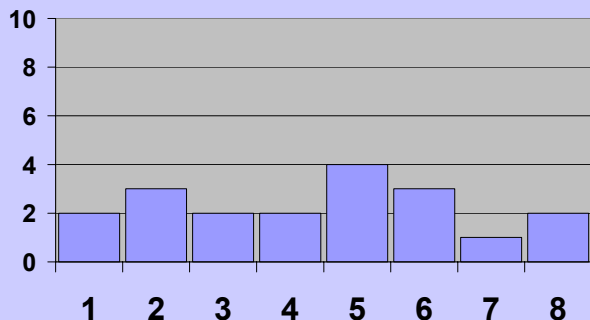


Lack of investment opportunities.

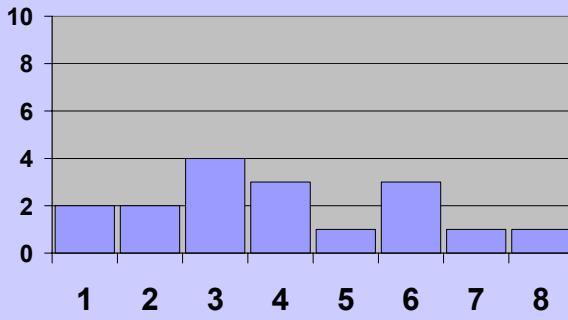


1f. Major constraints on profitable NCR Tilapia aquaculture development?

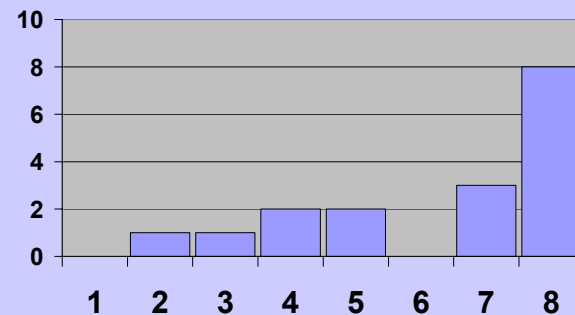
Lack of cost effective rearing technology.



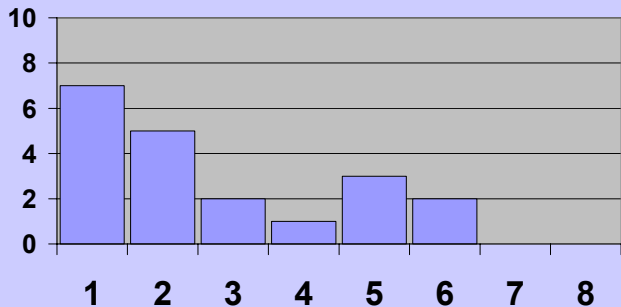
Lack of adequate markets for products.



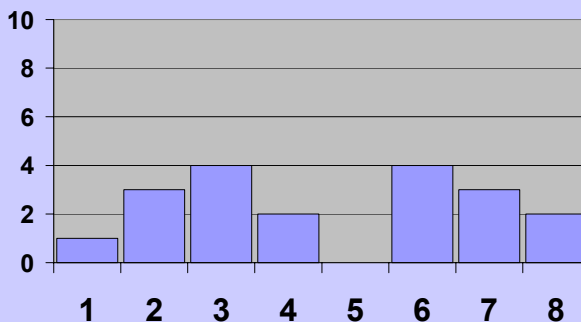
Competition from wild caught fisheries.



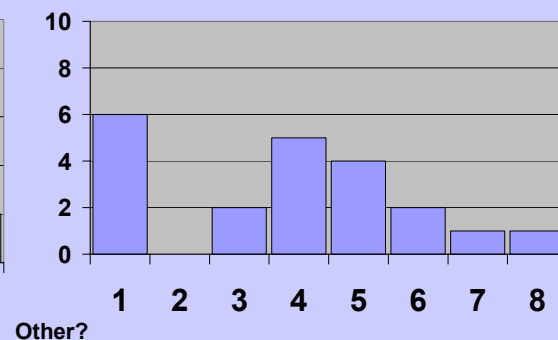
Competition from domestic or imported products.



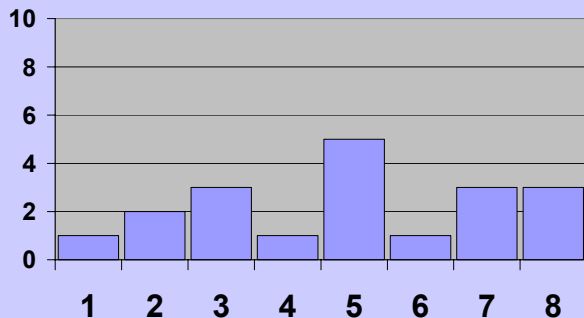
Lack of land and water resources.



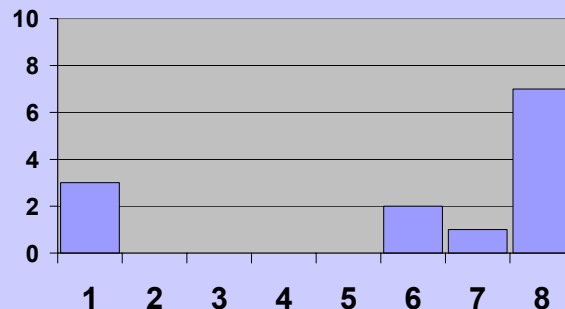
Government regulatory constraints.



Lack of investment opportunities.

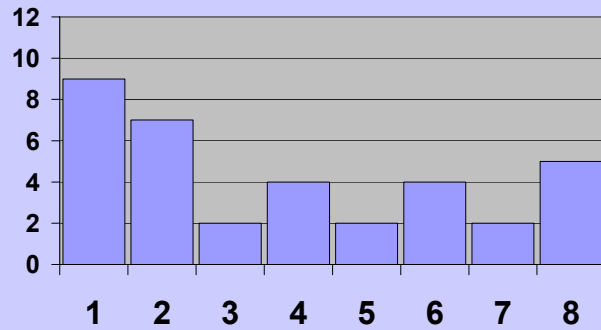


Other?

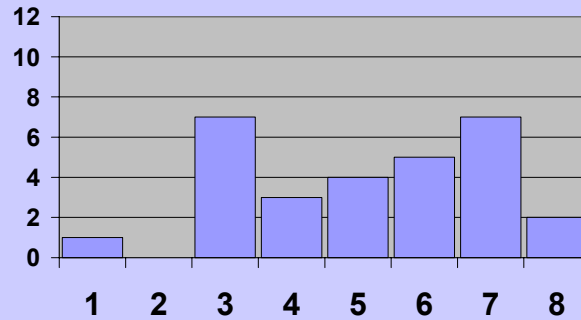


1g. Major constraints on profitable NCR Walleye aquaculture development?

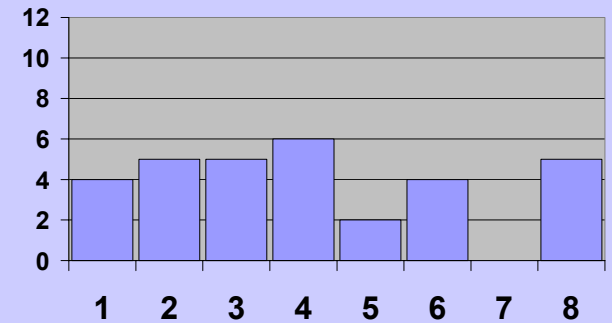
Lack of cost effective rearing technology.



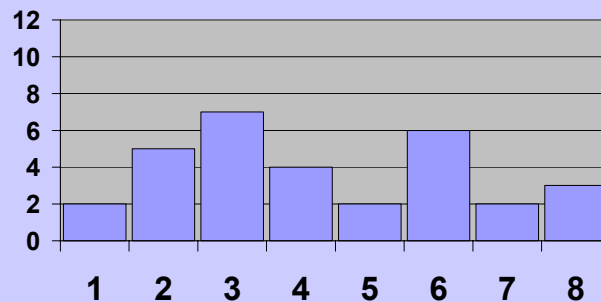
Lack of adequate markets for products.



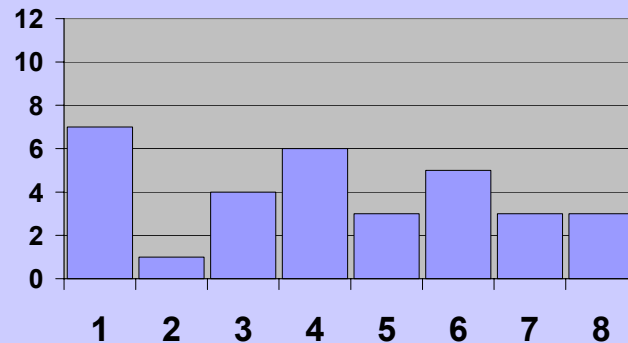
Competition from wild caught fisheries.



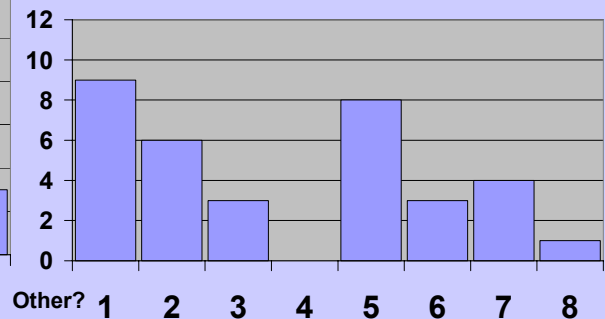
Competition from domestic or imported products.



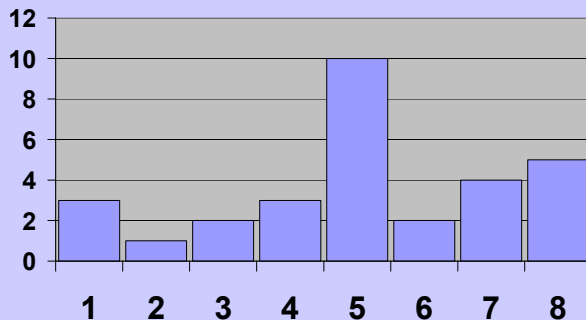
Lack of land and water resources.



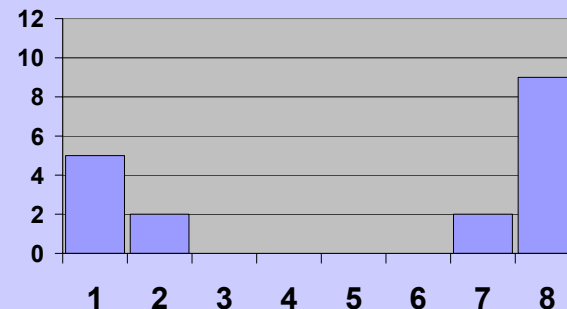
Government regulatory constraints.



Lack of investment opportunities

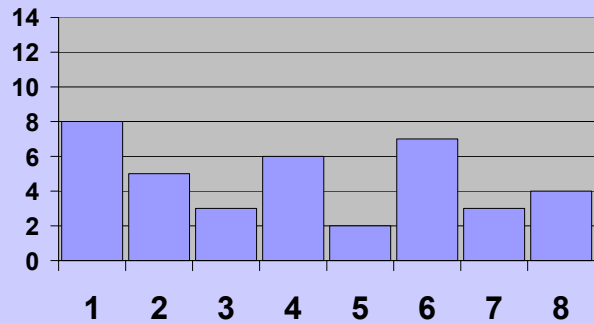


Other? 1 2 3 4 5 6 7 8

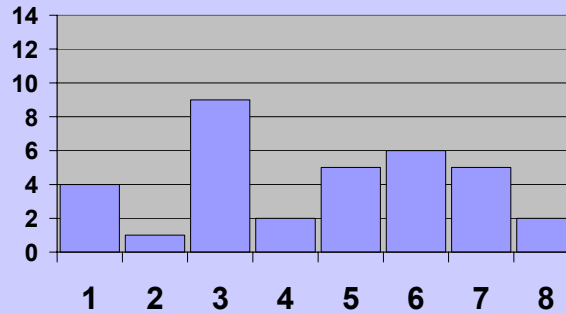


1h. Major constraints on profitable NCR Yellow Perch aquaculture development?

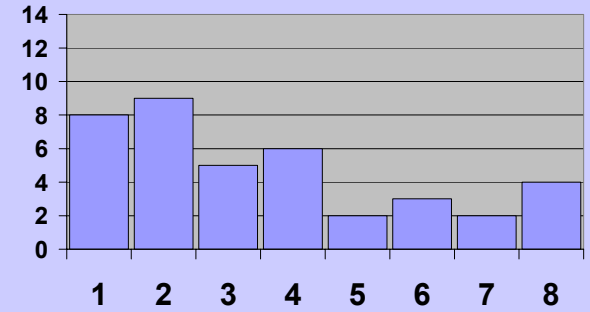
Lack of cost effective rearing technology.



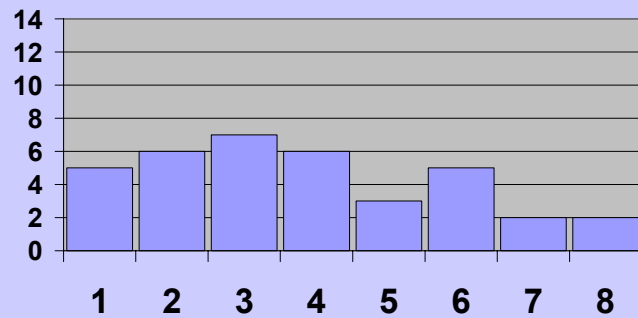
Lack of adequate markets for products.



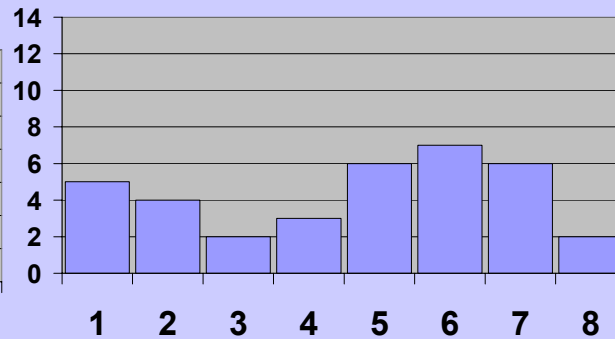
Competition from wild caught fisheries.



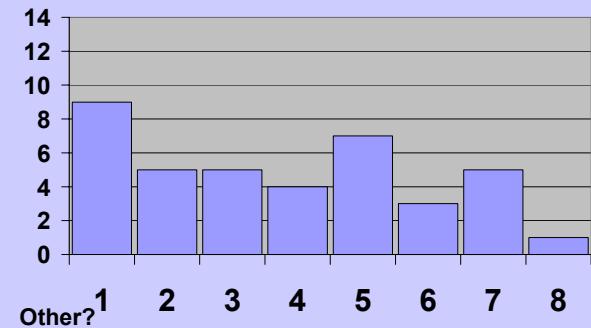
Competition from domestic or imported products.



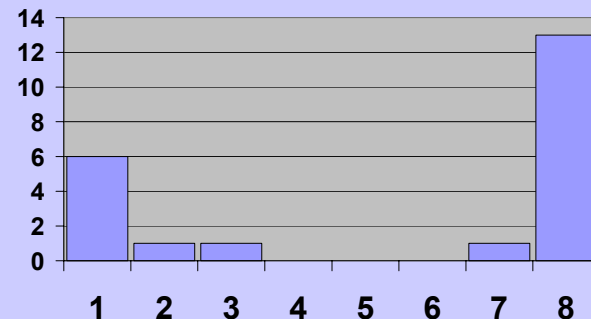
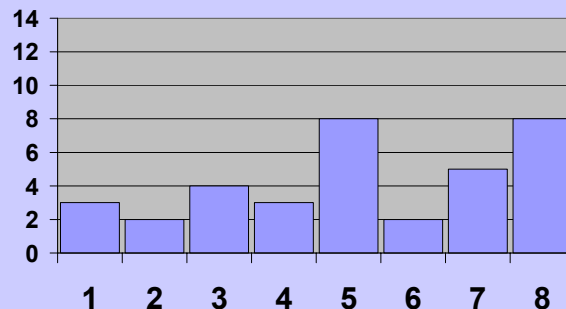
Lack of land and water resources.



Government regulatory constraints.



Lack of investment opportunities.

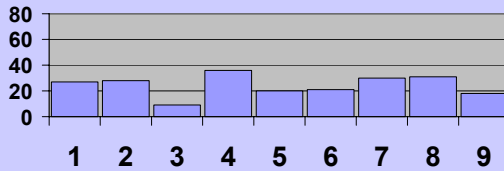


2. What aquaculture technology improvements need to be addressed to improve profitability of NCR aquaculture species?

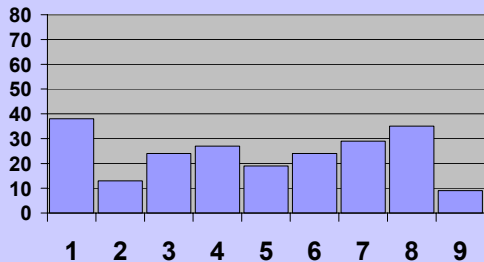
- Investigate ways to couple NCR aquaculture to other water-based industries to more efficiently use available resources for diversified and cost-effective production.
- Develop and apply genetic selective breeding and biotechnology approaches to improve growth and reproduction.
- Controlled reproduction and domesticated broodstock development.
- Out-of cycle (season) spawning.
- Nutrition and diet development.
- Early life stage rearing.
- Environmental conditions (e.g. temperature, stocking density, water quality) and their effects on survival, growth, and economic profit. Specialized rearing systems and techniques.
- Other?

2. What aquaculture technology improvements need to be addressed to improve profitability of NCR aquaculture species(general)?

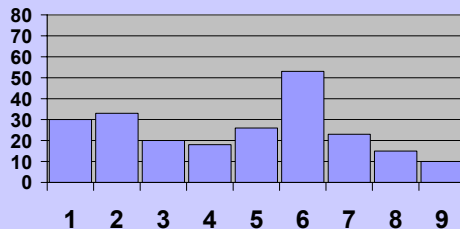
Investigate ways to couple NCR aquaculture to other water-based industries to more efficiently use available resources for diversified and cost-effective production.



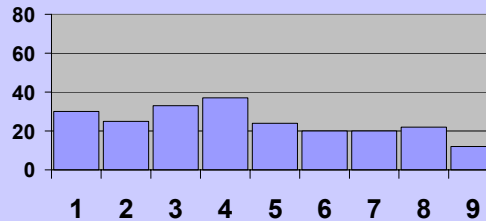
Out-of cycle (season) spawning.



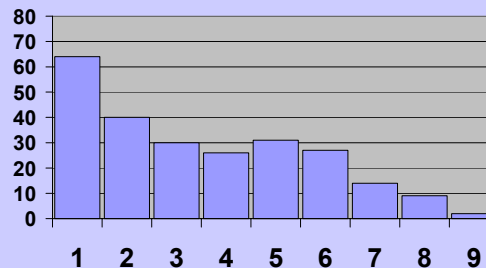
Specialized rearing systems and techniques.



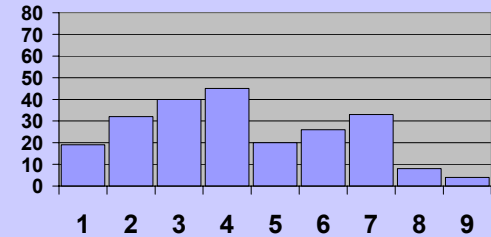
Develop and apply genetic selective breeding and biotechnology approaches to improve growth and reproduction.



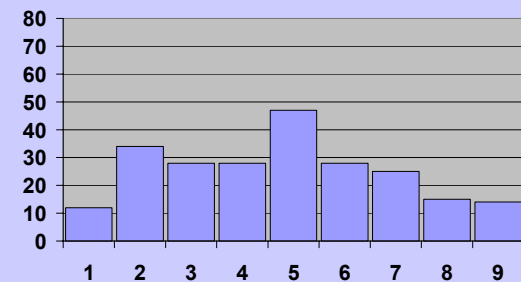
Nutrition and diet development.



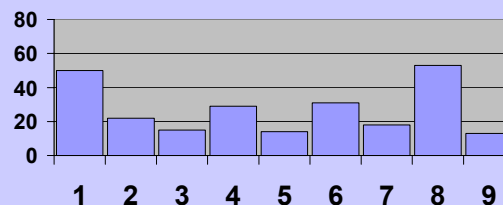
Controlled reproduction and domesticated broodstock development.



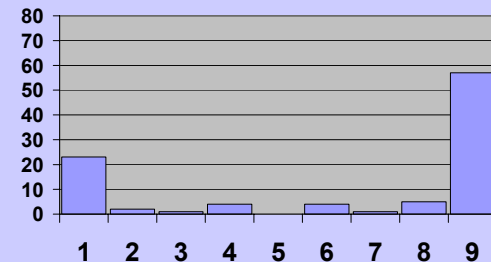
Early life stage rearing.



Environmental conditions (e.g. temperature, stocking density, water quality) and their effects on survival, growth, and economic profit.

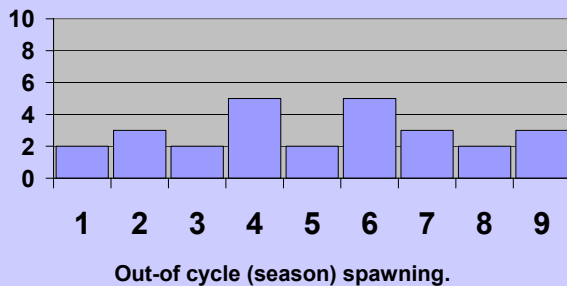


Other?

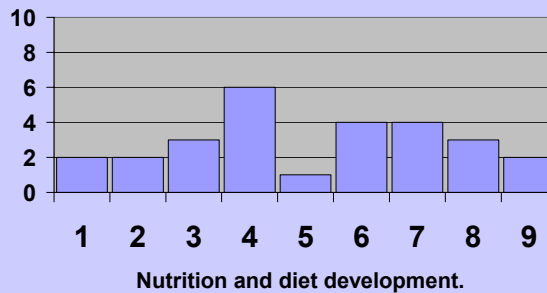


2a. Technology improvements need to improve profitability of NCR Baitfish aquaculture?

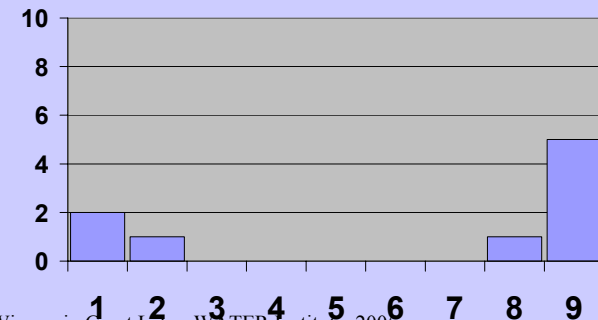
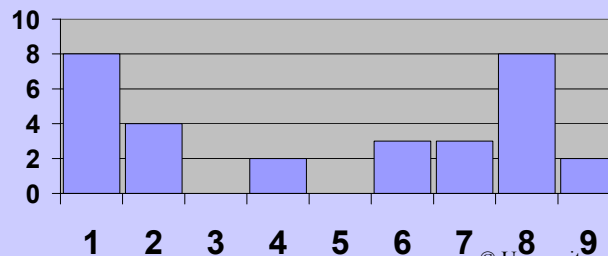
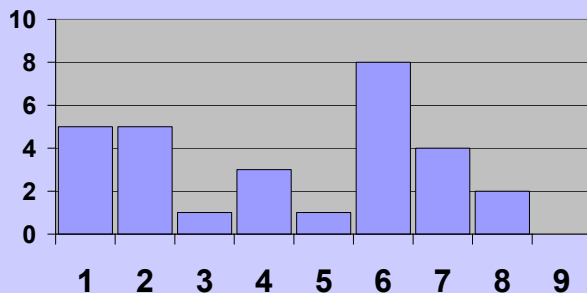
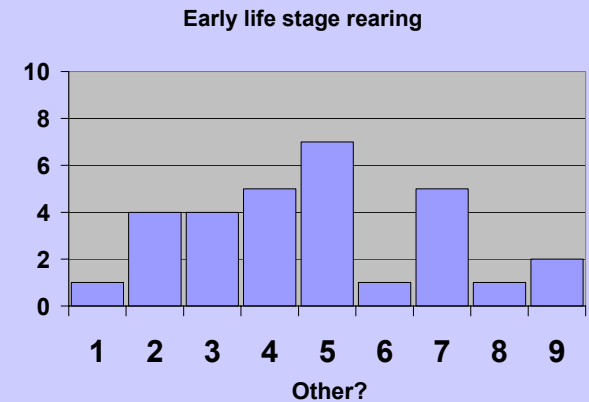
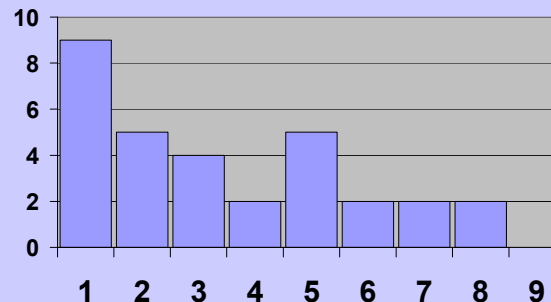
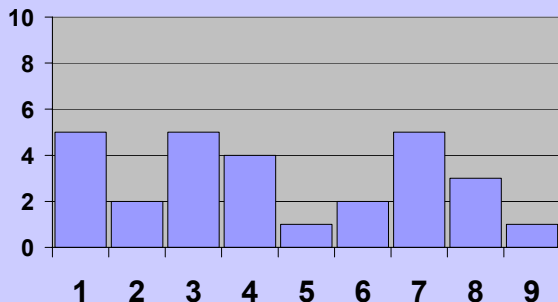
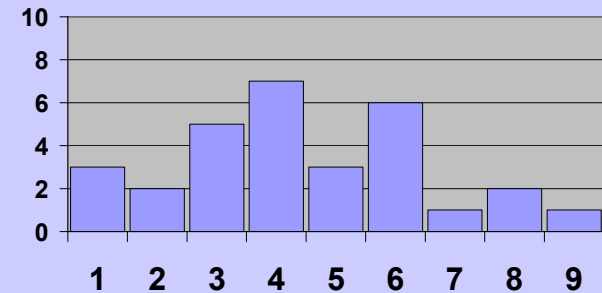
Investigate ways to couple NCR aquaculture to other water-based industries to more efficiently use available resources for diversified and cost-effective production.



Develop and apply genetic selective breeding and biotechnology approaches to improve growth and reproduction.

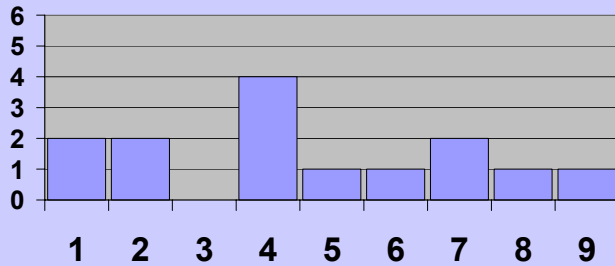


Controlled reproduction and domesticated broodstock development.



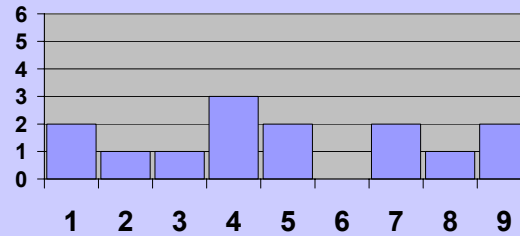
2b. What aquaculture technology improvements need to be addressed to improve profitability of NCR Hybrid Striped Bass aquaculture?

Investigate ways to couple NCR aquaculture to other water-based industries to more efficiently use available resources for diversified and cost-effective production.



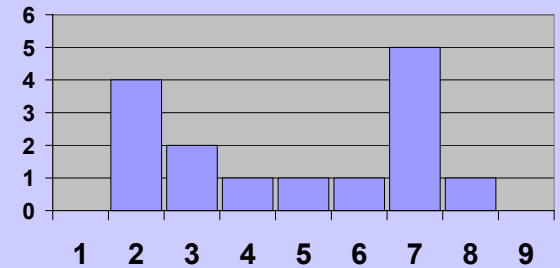
Out-of cycle (season) spawning

Develop and apply genetic selective breeding and biotechnology approaches to improve growth and reproduction.

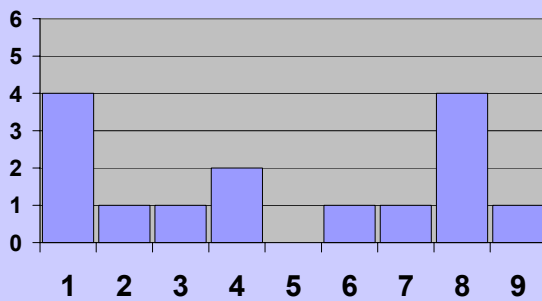


Nutrition and diet development.

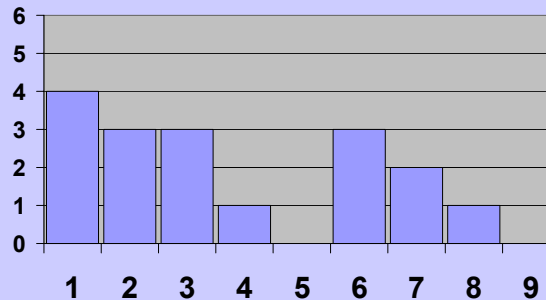
Controlled reproduction and domesticated broodstock development.



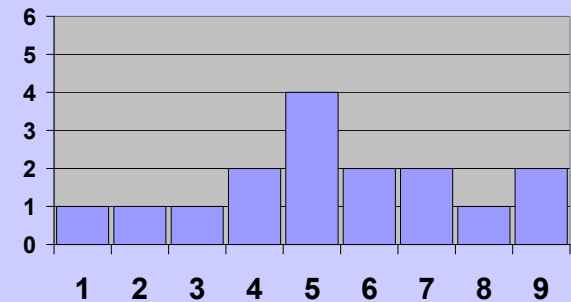
Early life stage rearing.



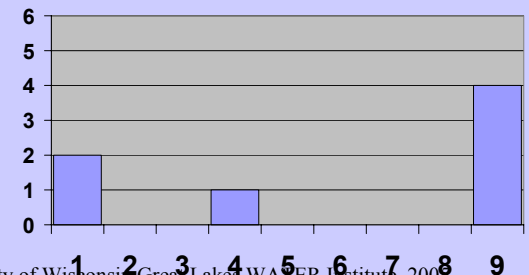
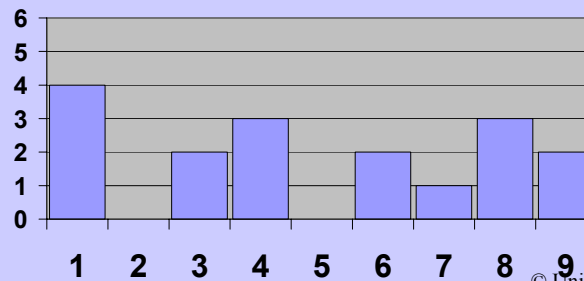
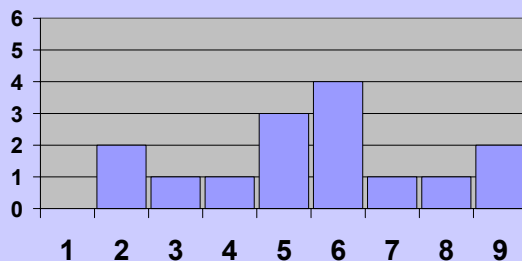
Specialized rearing systems and techniques.



Environmental conditions (e.g. temperature, stocking density, water quality) and their effects on survival, growth, and economic profit.



Other?

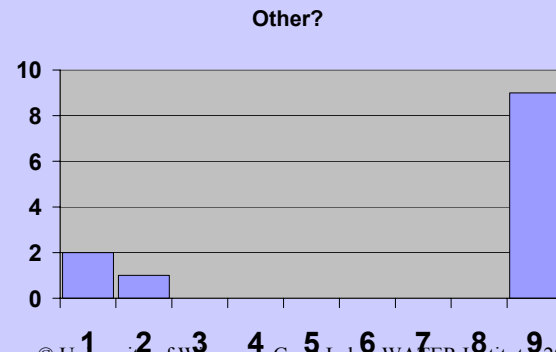
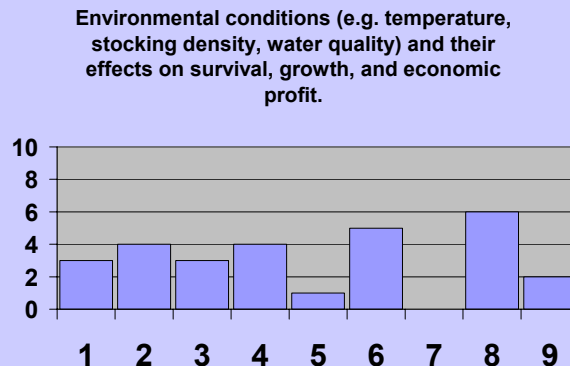
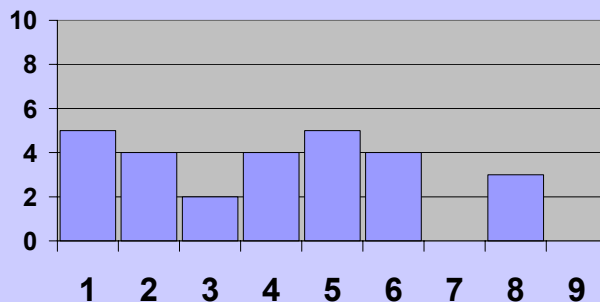
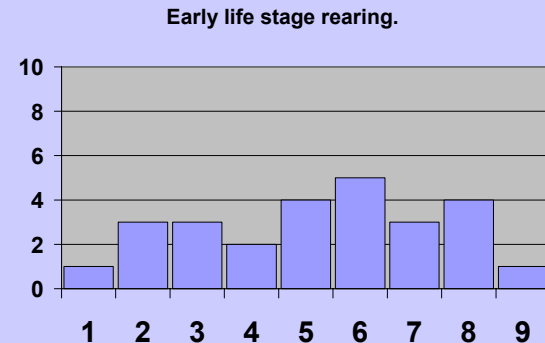
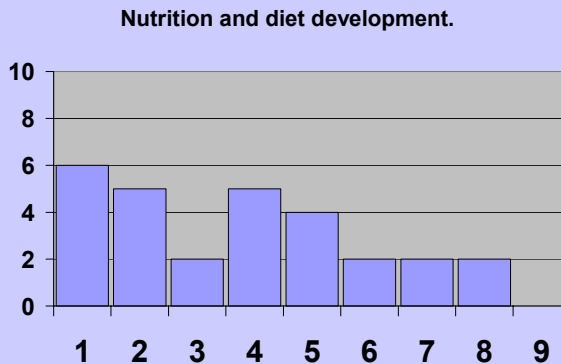
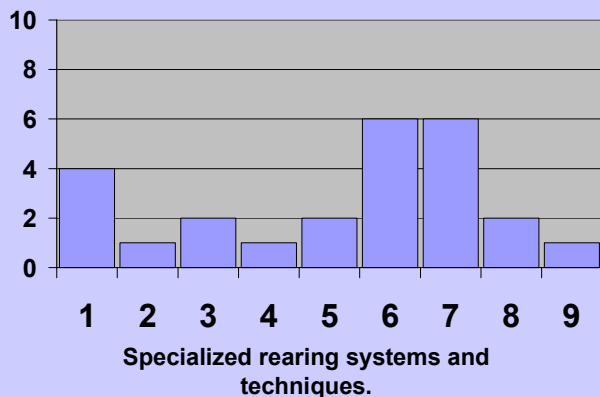
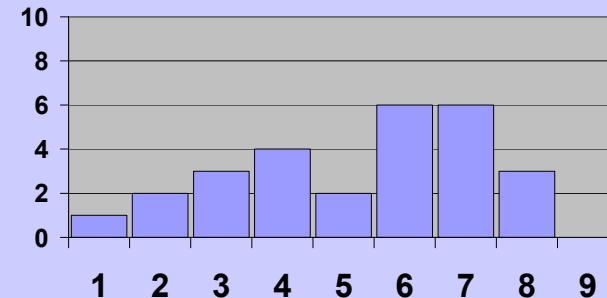
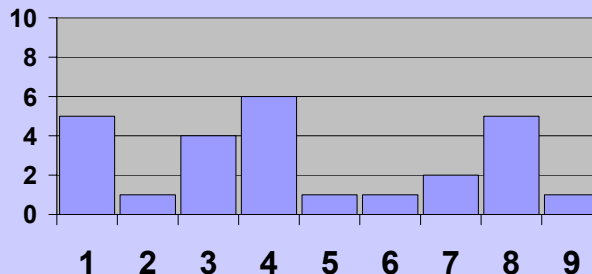
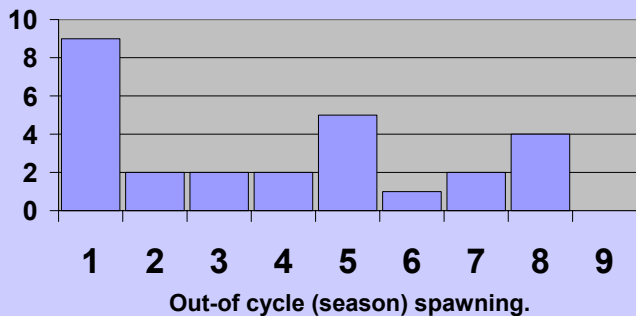


2c. Technology improvements need to improve profitability of NCR Salmonid aquaculture?

Investigate ways to couple NCR aquaculture to other water-based industries to more efficiently use available resources for diversified and cost-effective production.

Develop and apply genetic selective breeding and biotechnology approaches to improve growth and reproduction.

Controlled reproduction and domesticated broodstock development.

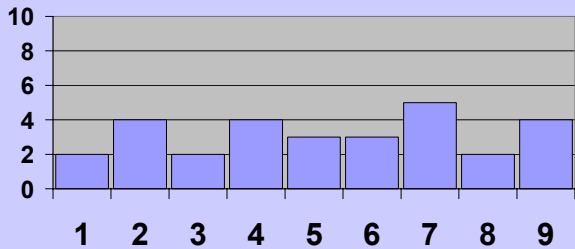


2d. Technology improvements need to improve profitability of NCR Sunfish aquaculture?

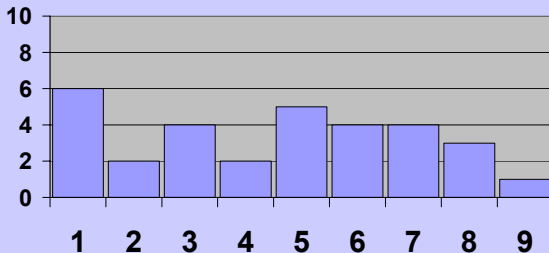
Investigate ways to couple NCR aquaculture to other water-based industries to more efficiently use available resources for diversified and cost-effective production.

Develop and apply genetic selective breeding and biotechnology approaches to improve growth and reproduction.

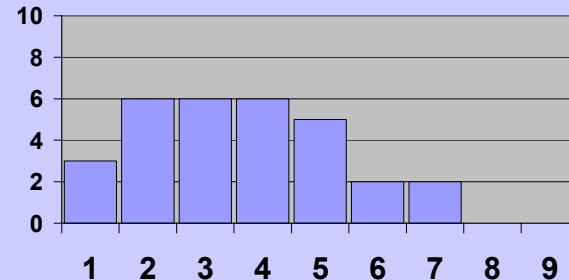
Controlled reproduction and domesticated broodstock development.



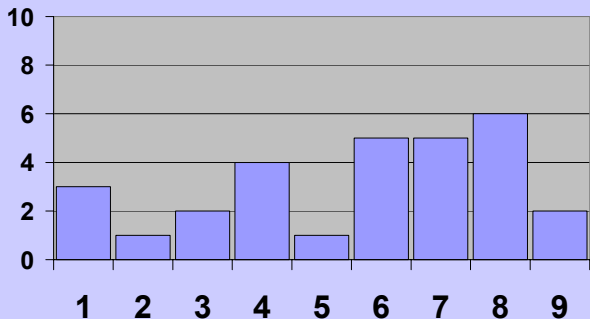
Out-of cycle (season) spawning.



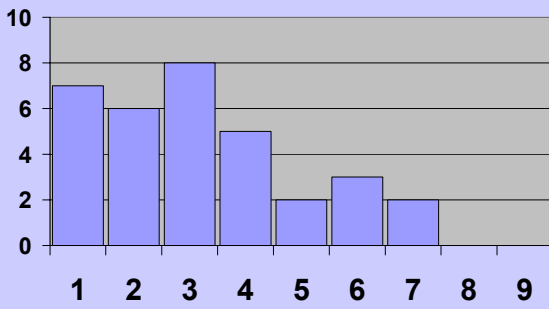
Nutrition and diet development.



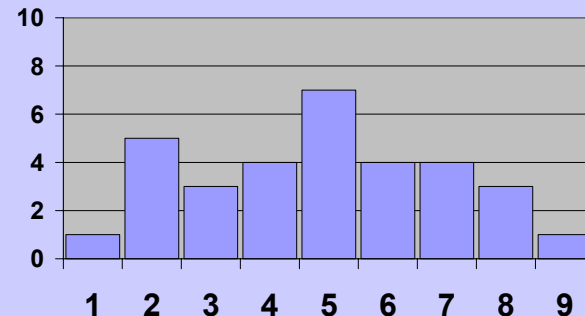
Early life stage rearing.



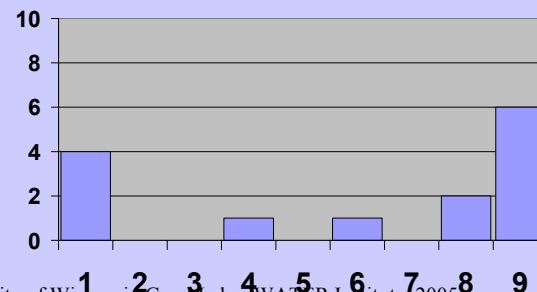
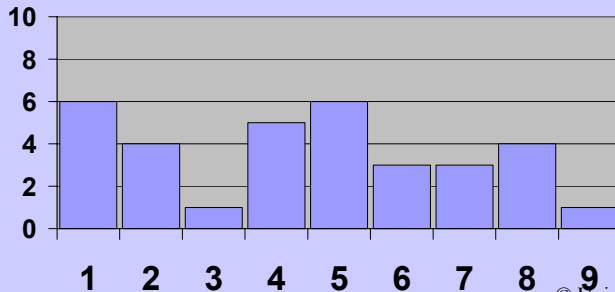
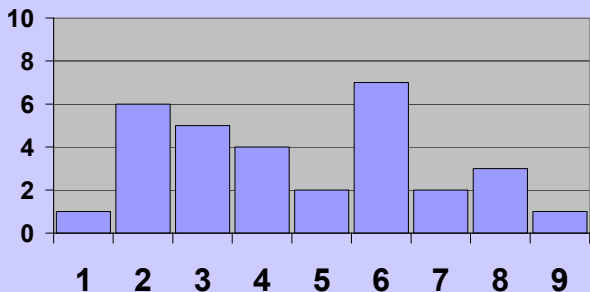
Specialized rearing systems and techniques.



Environmental conditions (e.g. temperature, stocking density, water quality) and their effects on survival, growth, and economic profit.

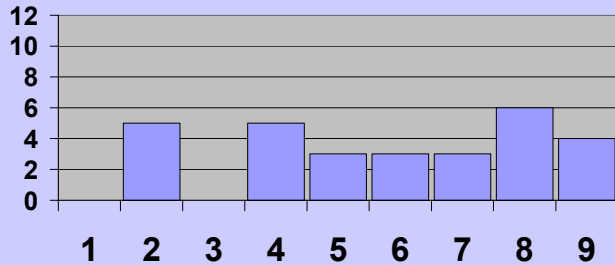


Other?



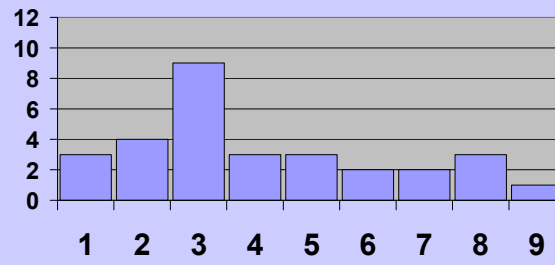
2e. Technology improvements need to improve profitability of Largemouth Bass aquaculture?

Investigate ways to couple NCR aquaculture to other water-based industries to more efficiently use available resources for diversified and cost-effective production.



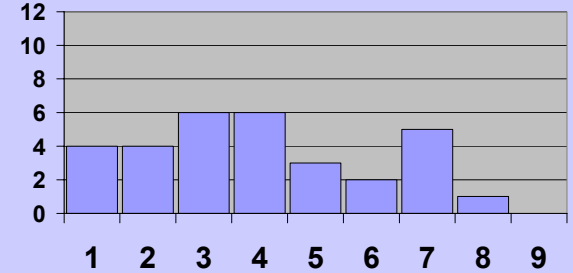
Out-of cycle (season) spawning.

Develop and apply genetic selective breeding and biotechnology approaches to improve growth and reproduction.

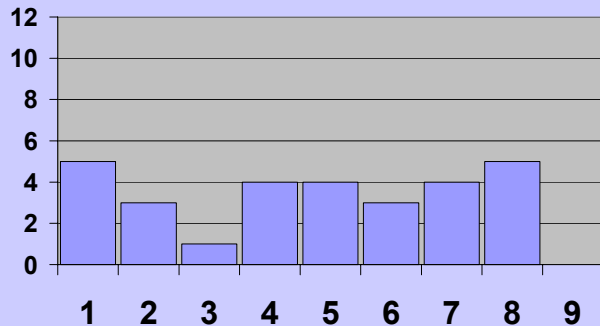


Nutrition and diet development.

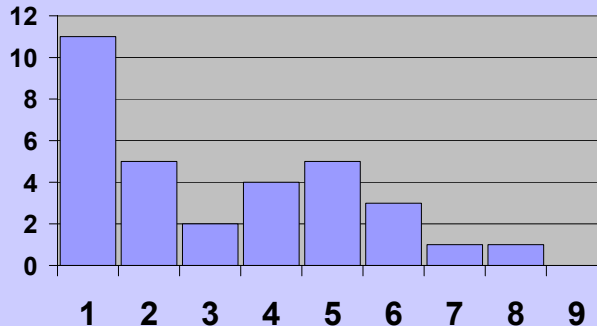
Controlled reproduction and domesticated broodstock development.



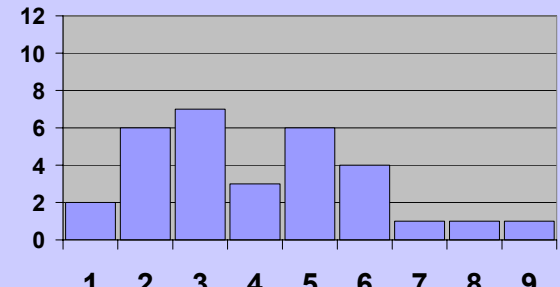
Early life stage rearing.



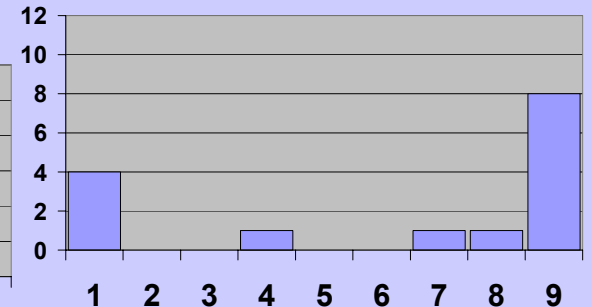
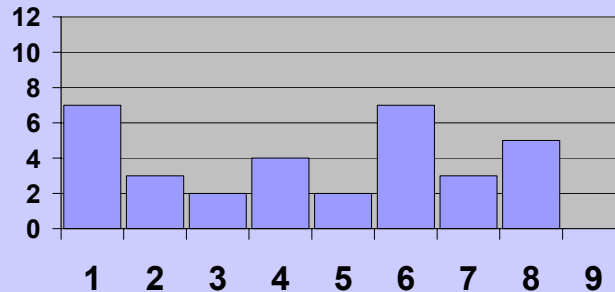
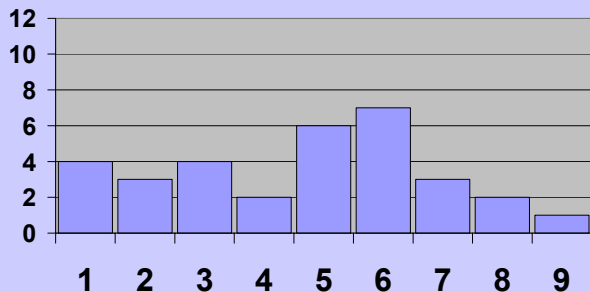
Specialized rearing systems and techniques.



Environmental conditions (e.g. temperature, stocking density, water quality) and their effects on survival, growth, and economic profit.

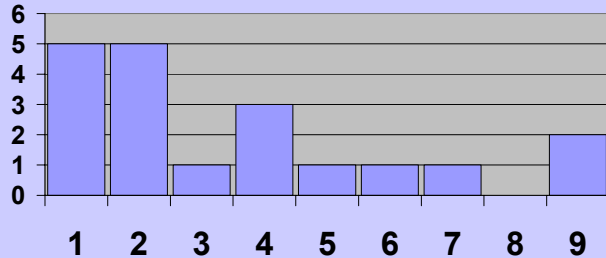


Other?



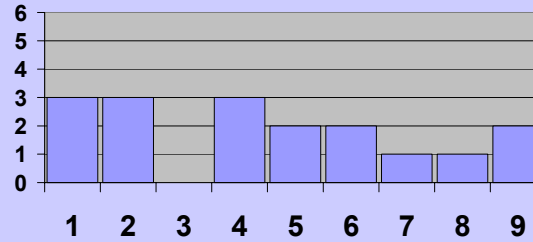
2f. Technology improvements need to improve profitability of Tilapia aquaculture?

Investigate ways to couple NCR aquaculture to other water-based industries to more efficiently use available resources for diversified and cost-effective production.



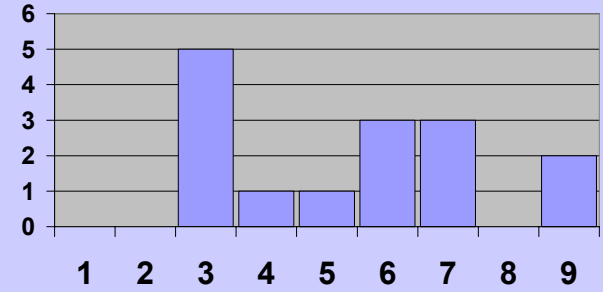
Out-of cycle (season) spawning.

Develop and apply genetic selective breeding and biotechnology approaches to improve growth and reproduction.

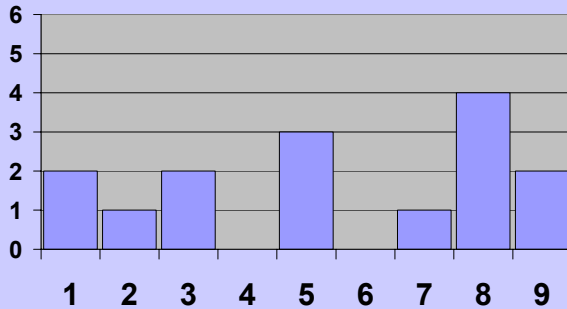


Nutrition and diet development.

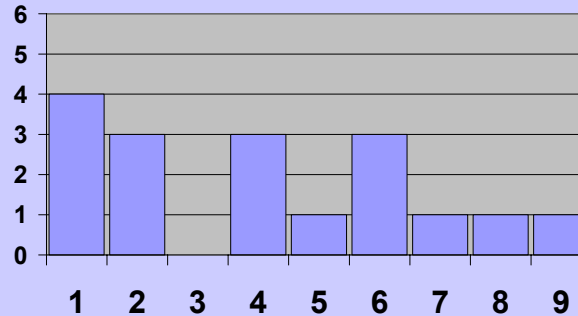
Controlled reproduction and domesticated broodstock development.



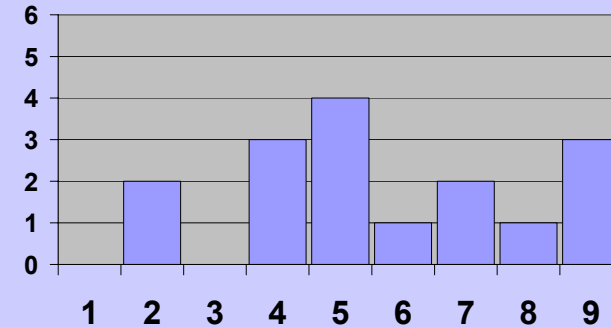
Early life stage rearing.



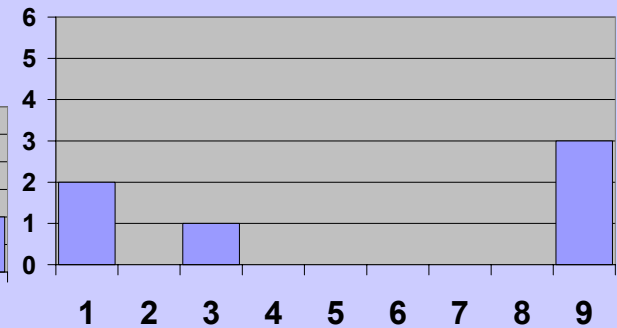
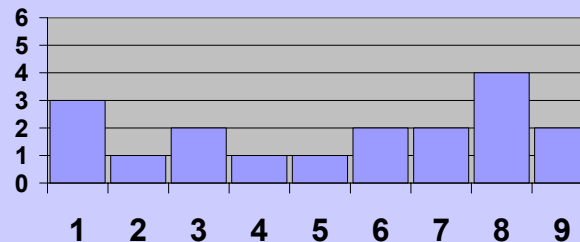
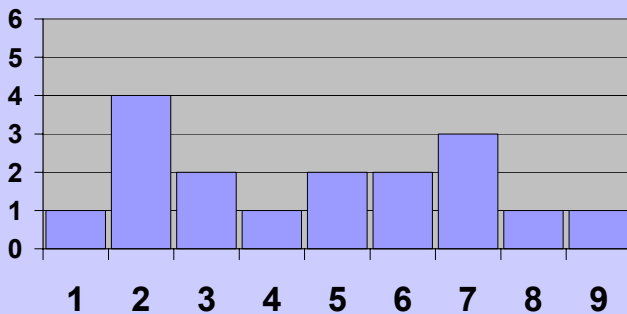
Specialized rearing systems and techniques.



Environmental conditions (e.g. temperature, stocking density, water quality) and their effects on survival, growth, and economic profit.



Other?

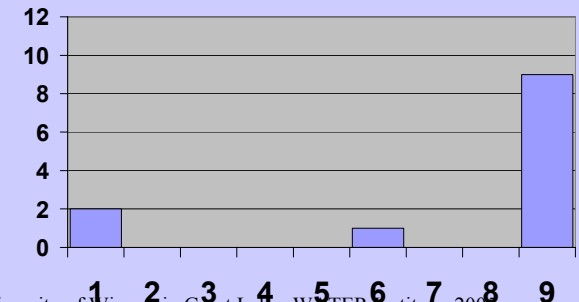
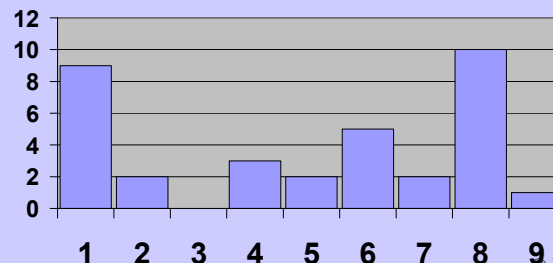
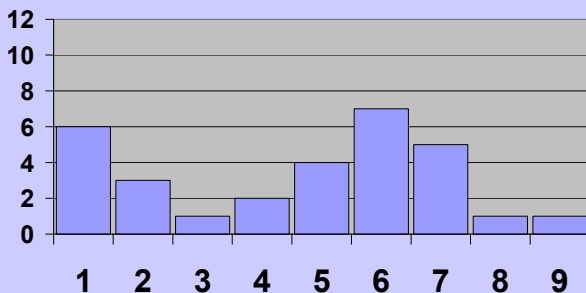
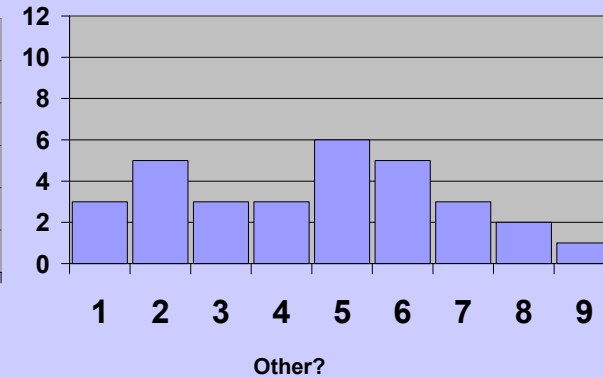
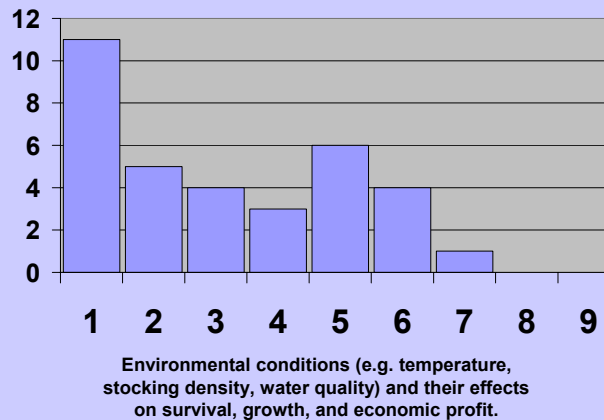
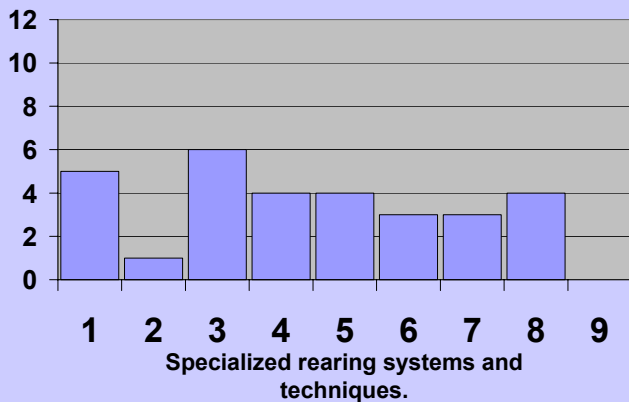
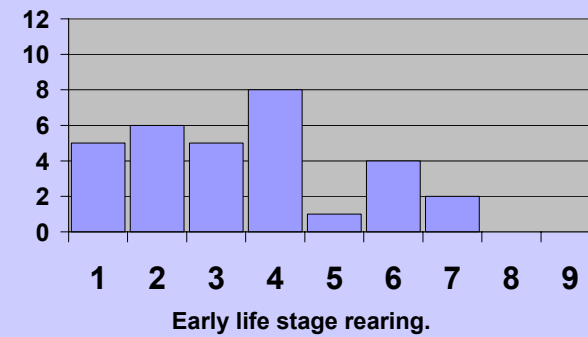
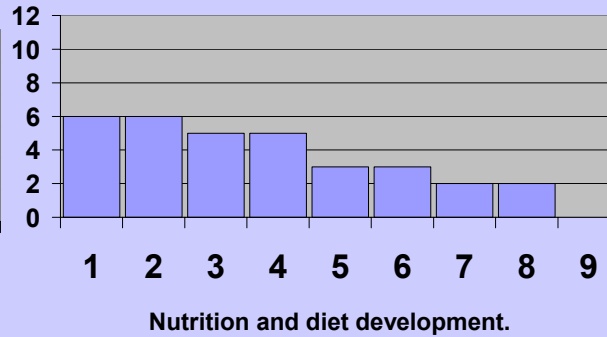
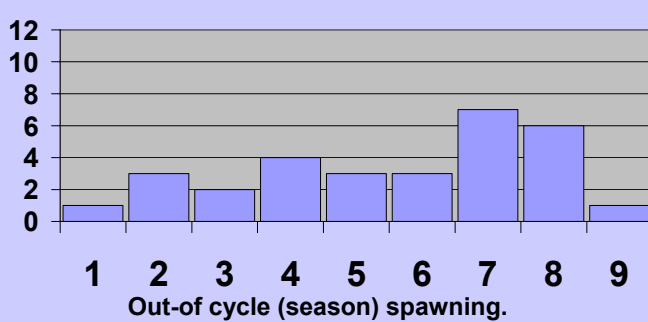


2g. Technology improvements need to improve profitability of Walleye aquaculture?

Investigate ways to couple NCR aquaculture to other water-based industries to more efficiently use available resources for diversified and cost-effective production.

Develop and apply genetic selective breeding and biotechnology approaches to improve growth and reproduction.

Controlled reproduction and domesticated broodstock development.

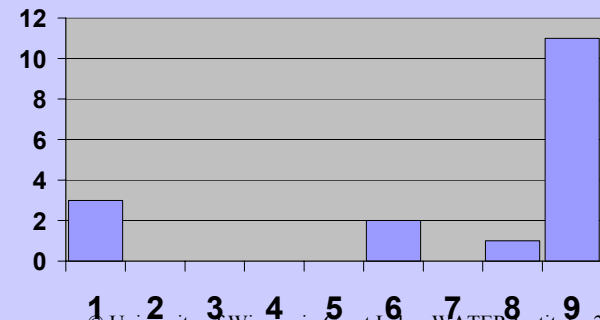
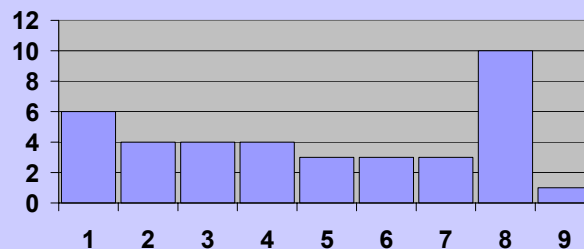
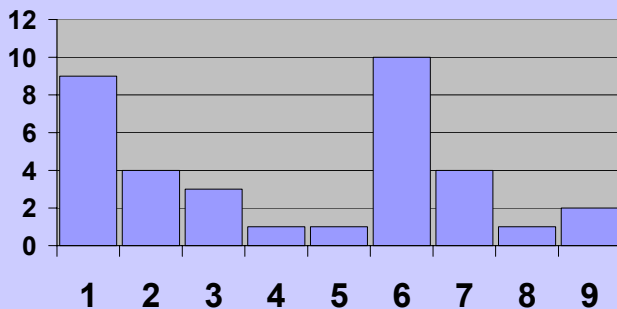
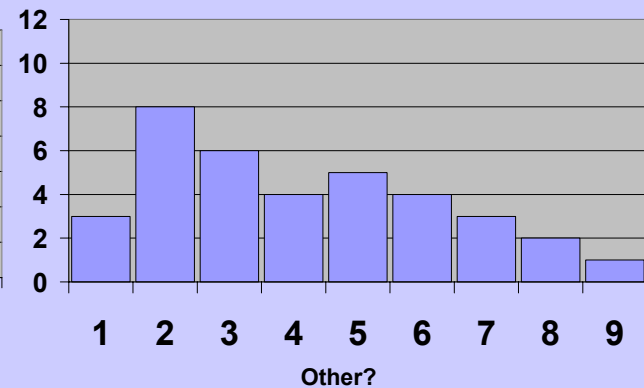
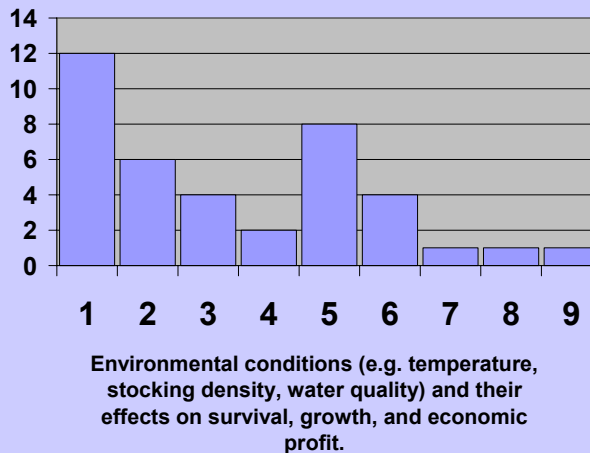
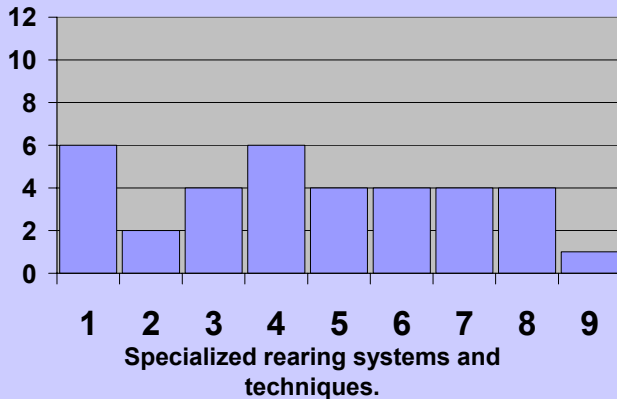
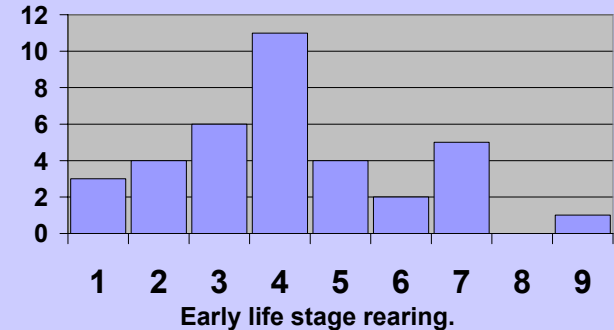
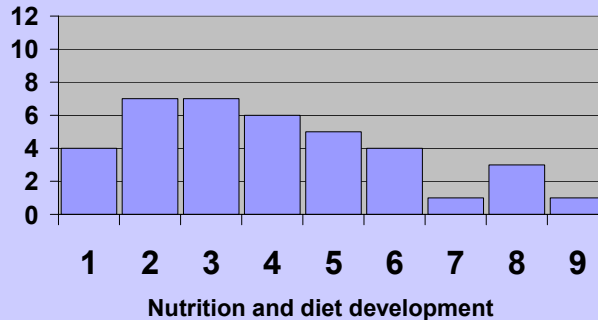
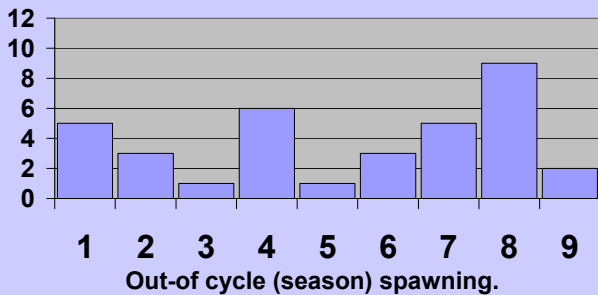


2h. Technology improvements need to improve profitability of Yellow Perch aquaculture?

Investigate ways to couple NCR aquaculture to other water-based industries to more efficiently use available resources for diversified and cost-effective production.

Develop and apply genetic selective breeding and biotechnology approaches to improve growth and reproduction.

Controlled reproduction and domesticated broodstock development.

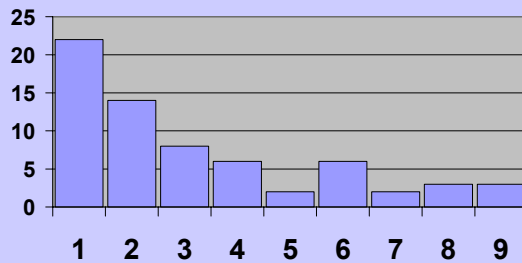


3. What aquaculture system management improvements need to be addressed?

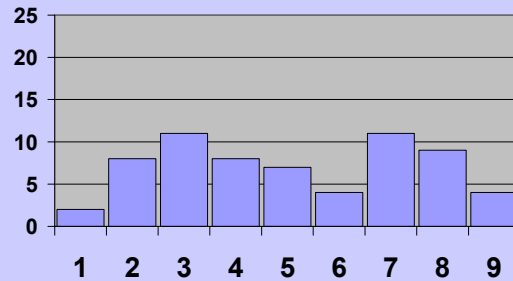
- Pond management related to vegetation, parasite, and predator control?
- Pond fertilization?
- Pond construction and regulation?
- Harvest and transport methods?
- Pond Flooding and runoff related water quality problems?
- Cage culture techniques
- Effluent/waste control and recycling to minimize environmental impact?
- More Cost effective development of climate controlled, recirculation rearing systems?
- Other?

3. What aquaculture system management improvements need to be addressed?

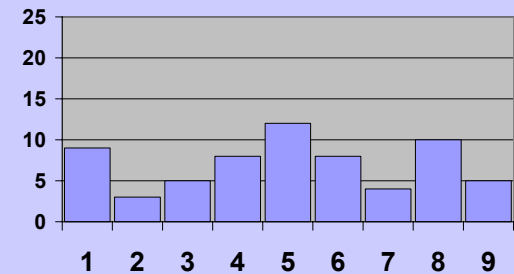
Pond management related to vegetation, parasite, and predator control?



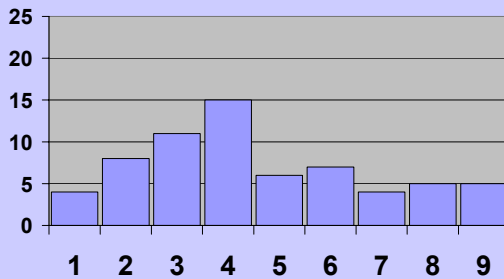
Pond fertilization?



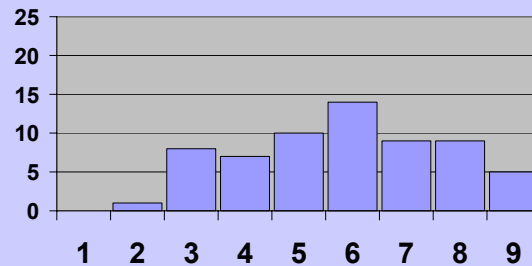
Pond construction and regulation?



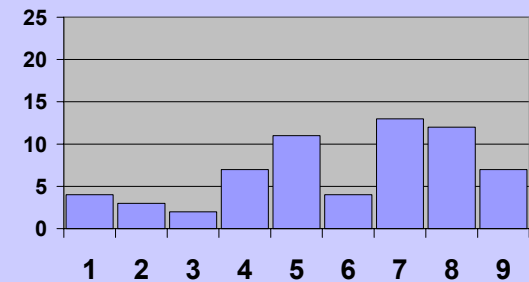
Harvest and transport methods?



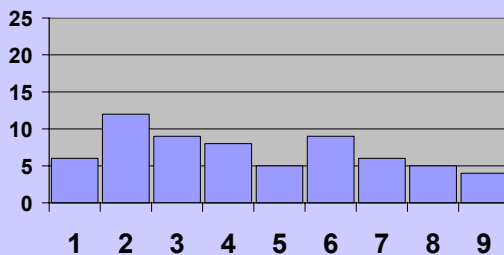
Pond Flooding and runoff related water quality problems?



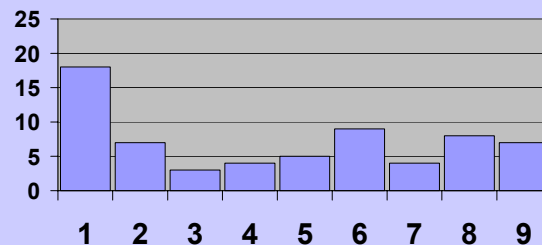
Cage culture techniques



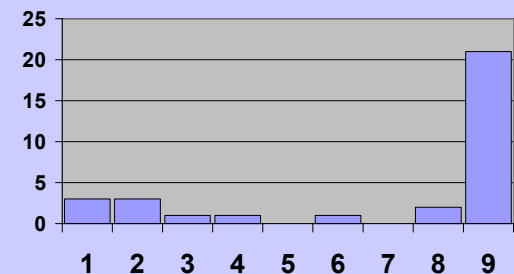
Effluent/waste control and recycling to minimize environmental impact?



More Cost effective development of climate controlled, recirculation rearing systems?



Other?

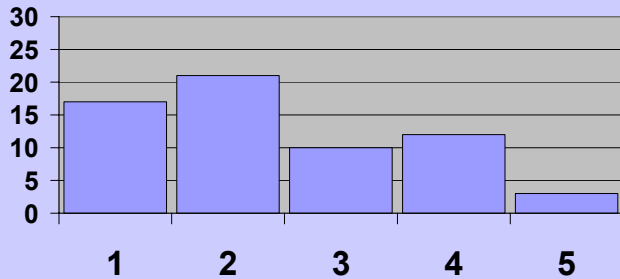


4. What aquaculture health and disease issues need to be addressed?

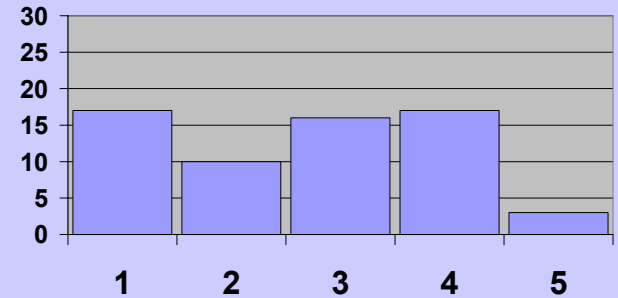
- **Development of improved methods to identify and control existing or emerging fish disease threats?**
- **Register and test more therapeutic compounds?**
- **Uniformity of regional regulations and standards regarding interstate transfers of fish?**
- **Investigate relationship between stress intensive rearing conditions and fish defensive response?**
- **Other?**

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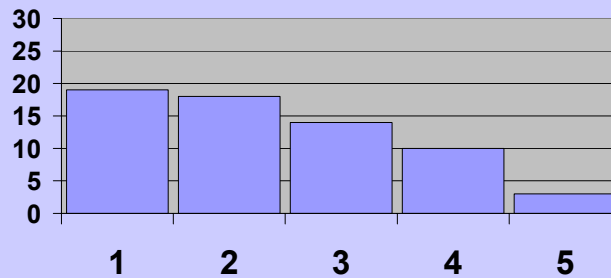
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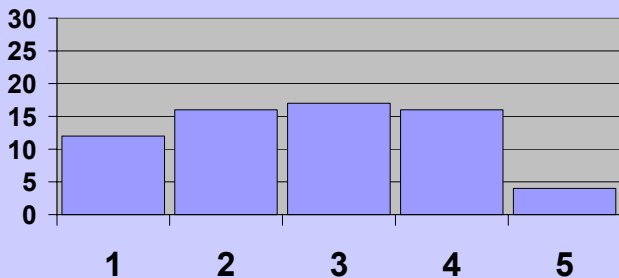
Register and test more therapeutic compounds?



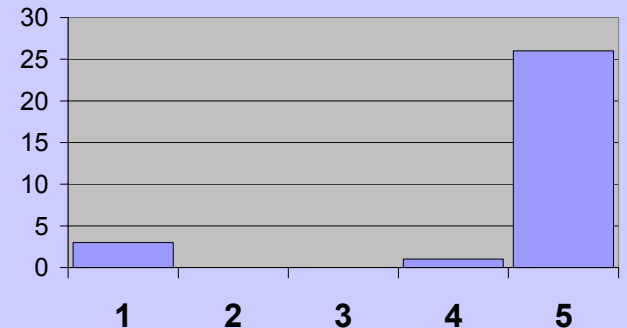
Uniformity of regional regulations and standards regarding interstate transfers of fish?



Investigate relationship between stress intensive rearing conditions and fish defensive response?



Other?

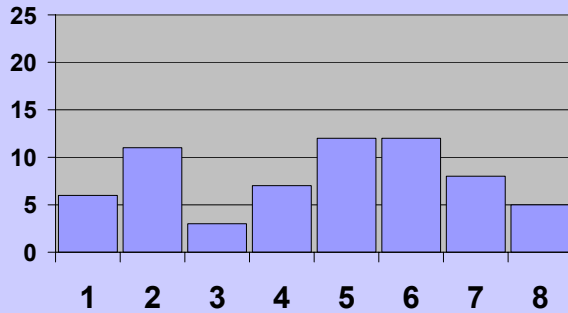


5. What types of extension activities are most beneficial to the development of NCR aquaculture?

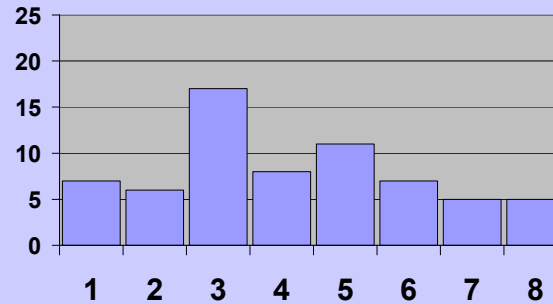
- **Regional workshops and conferences?**
- **State workshops and conferences?**
- **Interaction with state associations?**
- **Published extension materials- fact sheets, technical bulletins, newsletters, manuals and videos?**
- **Web based extension information?**
- **Phone accessibility to technical expertise (e.g. AREF phone line, Extension personnel)?**
- **Hands-on training and on-site assistance?**
- **Other?**

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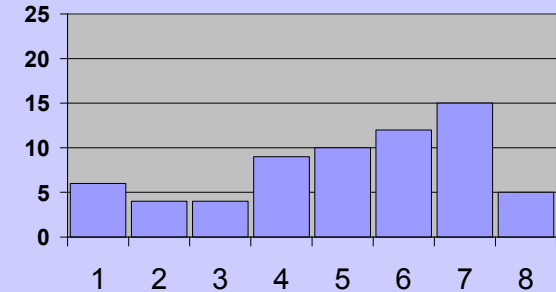
Regional workshops and conferences?



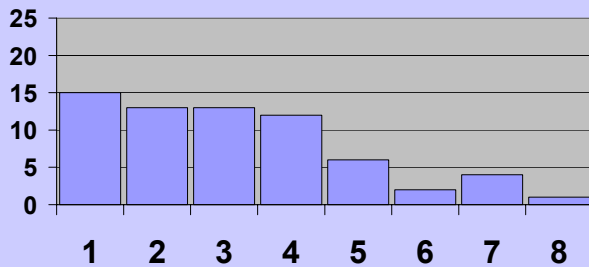
State workshops and conferences?



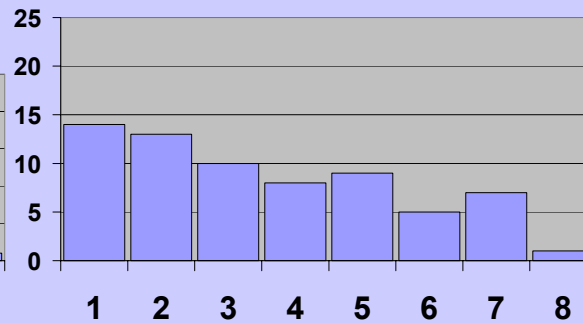
Interaction with state associations?



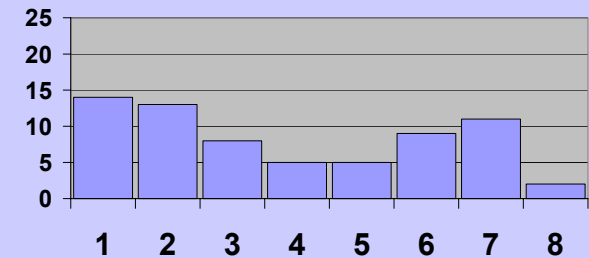
Published extension materials- fact sheets, technical bulletins, newsletters, manuals and videos?



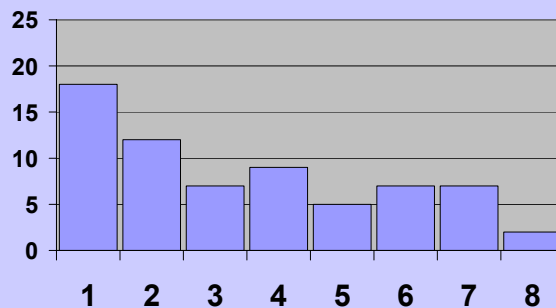
Web based extension information?



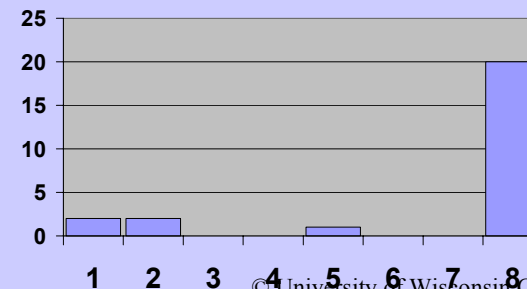
Phone accessibility to technical expertise (e.g. AREF phone line, Extension personnel)?



Hands-on training and on-site assistance?



Other?

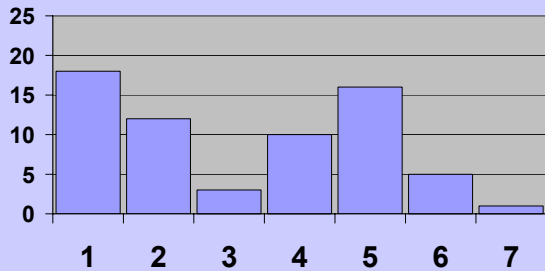


6. What should be NCRAC's role in aquaculture image enhancement, marketing, and information transfer?

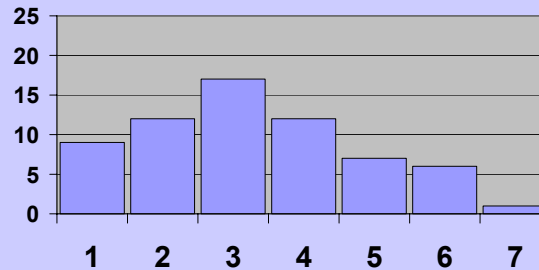
- Raise the level of political awareness of aquaculture potential?
- Raise the level of awareness of human health benefits of aquaculture products?
- Raise the level of awareness of aquaculture product quality- purity and freshness?
- Investigate and assess the nutritional and health benefits of regional aquaculture food products relative to fish and seafood products from other sources?
- Product development for niche markets?
- Raise the level of awareness of product identity and truthful labeling (e.g. zander mislabeling as lake perch)?
- Other?

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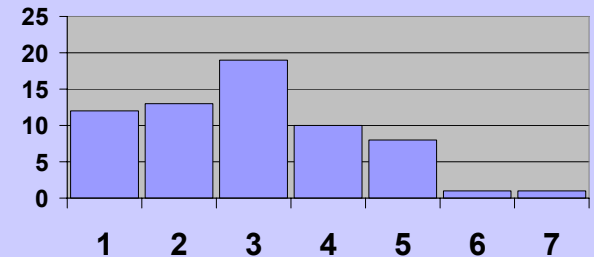
Raise the level of political awareness of aquaculture potential?



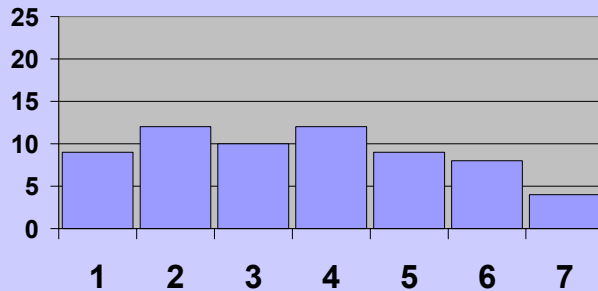
Raise the level of awareness of human health benefits of aquaculture products?



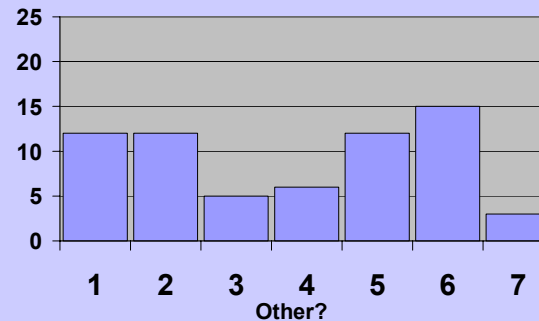
Raise the level of awareness of aquaculture product quality- purity and freshness?



Investigate and assess the nutritional and health benefits of regional aquaculture food products relative to fish and seafood products from other sources?



Product development for niche markets?



Raise the level of awareness of product identity and truthful labeling (e.g. zander mislabeling as lake perch)?

