Considering the Legal, Social, Economic, and Environmental Issues Regarding Proposals for Commercial Aquaculture Netpens in the Great Lakes

November 2, 2015
QOL Commercial Aquaculture Workgroup

• DEQ – Executive Division, Office of the Great Lakes, Water Resources Division
• DARD – Executive Division, Economic Development Division, Animal Industry Division, Environmental Stewardship Division
• DNR – Executive Division and Fisheries Division
Is net-pen aquaculture a suitable activity for Michigan’s waters of the Great Lakes?

1. Proposals presented to Michigan QOL agencies
2. Status of aquaculture in Michigan
3. Process of evaluation and resulting information
4. Public engagement process
Types of Aquaculture

1. Recirculating Aquaculture Systems (RAS)
2. Flow-through Systems
3. Pond Aquaculture
4. Net Pen (Cage) Aquaculture
Commercial Aquaculture Industry in Michigan

- Michigan has 43 active registered aquaculture facilities -- 24 are ponds; 14 are flow-through; 5 recirculating aquaculture systems.

- “A Strategic Plan for a Thriving & Sustainable Michigan Aquaculture” – MI Sea Grant and Origins
Open Water Net-Pen Culture in Ontario

- Six licensed net pen operations in Ontario: one in Parry Sound and five in the North Channel off the Manitoulin Island.
- Relatively low manpower except for feeding and harvest
- Reliant on land-based farms to supply fingerlings
Proposals Presented to QOL Agencies

Coldwater Fisheries, Inc.
- Currently in Ontario waters of Lake Huron
- Proposing two sites in Bays de Noc
- Targeting 385,000 lbs of RBT

Project Rainbow
- Aquaculture Research Corp.
- Three possible sites in NLH
- Targeting 500,000 lbs of RBT
Framework for Analysis

Ecosystem Management

Regulatory Authorities

Economics

Social Input

Environmental
Regulatory Authorities

State and Federal Permits & Licenses

- Construction Permit
  - DEQ and ACOE
- Bottomlands Conveyance
  - DEQ
- NPDES Permit
  - DEQ
- Fish Stocking Permit
  - DNR
- Registration of Aquaculture Facility
  - MDARD
- 2000 Consent Decree
  - DNR, USFWS, 5 Tribal Nations

Bi-National Agreements

- Great Lakes Water Quality Agreement
- Great Lakes Commission
- Great Lakes Fishery Commission
Based on current law, commercial netpens cannot legally operate in the Great Lakes.

- The Aquaculture Development Act of 1996 (PA 199) states that aquaculture facilities may only be registered by MDARD if they are operating in privately controlled waters.
- The Great Lakes are not privately controlled waters.
- Therefore, current state law does not allow the state to register a commercial net-pen aquaculture facility in the Great Lakes.
Economic Analyses

Does the market demand exist to warrant industry expansion?

1. Small Business Development Corporation – *broad overview of aquaculture industry globally*

2. MSU Dr. Steve Miller, et al. – *economic models developed for site specific examples*

3. MSU Dr. Frank Lupi – *balance of natural resource assets with critique of economic model*
The Business Case

• The US imports about 75 percent of the seafood it consumes.

• Growth constraints include feed costs, processing capacity, financing and experienced labor.

• Locating two one million pound facilities in Michigan would lead to up to 17 direct jobs, generating annual personal income of $1.2 million.

• This volume of production would likely contribute $4.3 million in annual gross domestic product, provided fish processing is done in Michigan.

• Recreational fishing in the Great Lakes is about $1 billion per year plus other tourism values.
Environmental/Ecological Review

Key Issues or Areas of Uncertainty

1. Environmental and ecosystem effects
2. Fish health and disease concerns
3. Effects of fish escapes on wild populations
4. Human health concerns
5. Siting considerations
6. Gaps in existing body of scientific literature
Great Lakes Net-Pen Commercial Aquaculture: A Short Summary of the Science

Submitted to the departments of Agriculture and Rural Development, Environmental Quality and Natural Resources

Eric J. Anderson, NOAA, Great Lakes Environmental Research Laboratory
John M. Dettmers, Great Lakes Fishery Commission
James S. Diana, University of Michigan, Sea Grant
Keith McCormack, Hubbell, Roth & Clark
James A. Morris, NOAA, National Ocean Service
David Scarfe, Aquatic Veterinary Associates LLC, USDA-APHIS-VS
Craig Stow, NOAA, Great Lakes Environmental Research Laboratory
Roy A. Stein, Chair, The Ohio State University
Science and Net Pen Aquaculture in the Great Lakes

The Panel Process

• Two meetings
• Agency presentations
• Conference calls with agency and industry personnel
• Multiple panel conference calls
• e-mail correspondence among panelists
• Three drafts discussed by panel
• Consensus-generated report, independent from agencies
Science and Net Pen Aquaculture in the Great Lakes

Overarching Management Approach - Active Adaptive Management

- Learn by doing net-pen aquaculture
- Sample Before, After, Control, Impact – BACI design
- Quantify net-pen effects, differentiate from ongoing changes in Great Lakes
- Goal to increase production and mediate environmental effects
Science and Net Pen Aquaculture in the Great Lakes

Operations

• Use sterile/triploid, native or naturalized fishes
• Monitor net-pen and cage operations
• Provide bonds to cover decommissioning costs
• Respond to Great Lakes issues, such as ice, zebra mussels, invasive species, etc.
Fish Disease and Human Health

- No concerns with fish health advisories
- Use disease-free fish
- Work to improve disease surveillance, monitoring, and reporting
- Use licensed and USDA-accredited veterinarians for disease treatments requiring antibiotics, etc.
- Adopt biosecurity plans - disease prevention highest priority
Questions a Farmer Might Ask

**BIOSECURITY LEVEL I**
- Which diseases are serious potential hazards?
- Is my farm at risk?
- How much risk?
- Operational impact of disease?
- Where can these hazardous diseases get in?

**BIOSECURITY LEVEL II**
- What can be done to prevent disease entry or escape?
- What should I do if disease gets in?

**BIOSECURITY LEVEL III**
- Are any of these diseases on the farm?
- How do I continue to monitor disease absence/presence?

**BIOSECURITY LEVEL IV**
- How do I get third-party recognition of disease freedom?

**BIOSECURITY LEVEL V**
- How do I get third-party recognition of disease freedom?

<table>
<thead>
<tr>
<th>Formal Biosecurity Process/Steps</th>
<th>Documentation &amp; Records</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Hazard Identification &amp; Prioritization</td>
<td>Prioritized Disease List</td>
</tr>
<tr>
<td>2. Risk-Impact Assessment</td>
<td>Evaluation of Disease Impacts</td>
</tr>
<tr>
<td>3. Critical Control Point (CCP) Evaluation</td>
<td>Identify Correctable CCPs</td>
</tr>
<tr>
<td>4. Mitigation, Management &amp; Remediation of CCP Risks</td>
<td>Implement CCP Corrective Actions</td>
</tr>
<tr>
<td>5. Contingency Planning</td>
<td>Isolation, Treatment Depopulation Plans</td>
</tr>
<tr>
<td>6. Clinical Evaluation &amp; Diagnostic Testing</td>
<td>Farm, Lab &amp; Vet Records Results</td>
</tr>
<tr>
<td>7. Ongoing Disease Surveillance &amp; Monitoring</td>
<td>Farm, Lab &amp; Vet Records Results</td>
</tr>
<tr>
<td>8. Veterinarian Auditing &amp; Certification</td>
<td>Certificate of Veterinary Inspection (CVI)</td>
</tr>
<tr>
<td>9. Veterinary Authority (Gov't) Verification &amp; Endorsement</td>
<td>Gov't Endorsed Certificate of Veterinary Inspection (CVI)</td>
</tr>
</tbody>
</table>

(after Palić et al. 2015)
Ecological Interactions

- Effluents
  - Capture/treat effluents – technologically infeasible
  - Minimize ecosystem impacts by siting appropriately
  - Use native or naturalized fishes
  - Follow rigorous principles in Waples (2012) to reduce genetic impacts
Science and Net Pen Aquaculture in the Great Lakes

Siting

- Recognize how much we know and don’t know

- Use rigorous data-driven modeling to characterize important site-specific metrics such as flushing

- Develop siting tool, similar that developed for siting windpower in the Great Lakes (Lakebed Alteration Decision Support Tool)
# Relevant Data Sets for Assessing Siting Conditions in the Great Lakes

<table>
<thead>
<tr>
<th>Data</th>
<th>Source</th>
<th>Link</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meteorological conditions</td>
<td>NOAA National Center for Environmental Information (NCEI)</td>
<td><a href="https://www.ncei.noaa.gov/">https://www.ncei.noaa.gov/</a></td>
</tr>
<tr>
<td>Oceanographic conditions</td>
<td>NOAA National Ocean Service (NOS)</td>
<td><a href="http://tidesandcurrents.noaa.gov/">http://tidesandcurrents.noaa.gov/</a></td>
</tr>
<tr>
<td></td>
<td>NOAA Great Lakes Environmental Research Laboratory (GLERL)</td>
<td><a href="http://www.glerl.noaa.gov/res/glcfs/">http://www.glerl.noaa.gov/res/glcfs/</a></td>
</tr>
<tr>
<td></td>
<td>Great Lakes Observing System (GLOS)</td>
<td><a href="http://www.glos.us/">http://www.glos.us/</a></td>
</tr>
<tr>
<td>Bathymetric data</td>
<td>NOAA National Center for Environmental Information (NCEI)</td>
<td><a href="https://www.ncei.noaa.gov/">https://www.ncei.noaa.gov/</a></td>
</tr>
<tr>
<td>Lakebed Alteration Tool</td>
<td>University of Michigan</td>
<td><a href="http://www.glgis.org/ladst/">http://www.glgis.org/ladst/</a></td>
</tr>
<tr>
<td>Ecological Data</td>
<td>EPA</td>
<td><a href="http://www.epa.gov/glnpo/">http://www.epa.gov/glnpo/</a></td>
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<tr>
<td>General Information</td>
<td>NOAA/GLERL</td>
<td><a href="http://www.glerl.noaa.gov">http://www.glerl.noaa.gov</a></td>
</tr>
</tbody>
</table>
Panel Reflections

• Consent Decree, Joint Strategic Plan, GLWQA 2012, LAMP

• The Precautionary Principle: Adopt, err on the side of caution because we don’t have much experience

• Finite Phosphorus Loadings: QOL group limits P loading through regulation

• Critical siting considerations
Critical Siting Considerations: The challenge of finding net-pen sites with low-impact (re ecosystem structure and function), high-yield (re fish production) in the Great Lakes.

- Necessary Infrastructure for Biosecurity, Shipping, Highly Skilled Work Force, Access to Materials, etc.
- Flushing Rate
- Protection from Wave Action, Storms, Ice
- Areas Desiring Economic Development
Tribal Nation Input

- 9 of the 12 federally recognized tribes participated in meeting
- Concern for negatively affecting the fishery and water quality
- Nearly 1,700 written comments were received
- Desire to be a part of any future process
Social Input/Public Engagement Process

- Nearly 1,700 written comments were received
- Opposition (approximately 1,600 letters)
  - Risks to water quality, the fishery (genetics, disease, escapes), and tourism
  - Some voice support for recirculating, closed, and flow-through aquaculture
- Support (11 letters)
  - provision of jobs, economic benefits to local economies, and provision of a desired product
- Other Considerations for shared management of Great Lakes
Thank You

http://www.michigan.gov/aquaculture
• Review our core programs

• Review priority inspection activities

• Fee increase activity
  – Legislative changes
  – Implementation

• Other priority activities – Great things are happening!
Our Core Programs

• Protecting the animal feed supply and its link to animal and human health.

• Conducting 3rd-party audits to verify the grade and quality of fruits and vegetables and ensure good agricultural and handling practices are being followed.

• Facilitating international and interstate trade.
Our Core Programs

• Detecting and responding to exotic pests.

• Ensuring the availability and appropriate use of both restricted and general use pesticides.

• Ensuring bulk agrichemical storages facilities are constructed, installed, and maintained to protect health and the environment.
Priority inspection activities

• Feed safety activities including, medicated feed and elevator sanitation inspections.

• Pesticide use inspection and investigation activities including, responding to suspected or alleged misuse of pesticides.

• Trade facilitation activities including export certification.
Fee Increase Activity - Pesticides

- Increased the pesticide product registration fee from $40 per product to $100 per product.

- Eliminate the private applicator fee sunset.

- Added resident agent language.

- Added auditing language.
Implementation

• Increase inspections, surveillance and timely follow-up.
  – Schools, day care centers, and public buildings to prevent misuse and harm to health
  – Marketplace surveillance of products to prevent unregistered, unapproved and unsafe pesticides from being sold.
  – Pesticide misuse complaint follow-up and timely closure of investigations.

• New staff resources
• Lab analysis support
Modernize the process for certifying applicators.

- Computer based testing
- Exam scheduling changes
- Review laws and regulations
- On-line exam preparation tools
- Modernize the recertification by seminar attendance program
Fee Increase Activity - Fertilizer

• Increased fertilizer inspection fees from $.10 per ton to $0.35 per ton for all products.

• Added resident agent language.

• Fertilizer research fund established.

• Fertilizer Advisory Committee created.

• Added auditing language
Implementation

• Bulk storage
  – 30% growth in commercial bulk storage
  – Consultation, education and inspection.

• Increased auditing of firms, both in-state and out-of-state.
  – Michigan Department of Treasury
Fee Increase Activity - Feed

• Increase the feed tonnage fee from $0.13 per ton to $.30 per ton.
  – By-products with a moisture rate above 60% would have a new rate of $.15 per ton.

• Increase the feed licensing fee from $25 to $100.

• Added resident agent language.

• Added auditing language.
Implementation

• Replace federal grant funding that ended in 2015.

• Focus on feed safety inspections including medicated feed inspections and elevator sanitation inspections.

• Increased auditing of firms, both in-state and out-of-state.
  – Michigan Department of Treasury

• New staff resources.

• Lab analysis support.
Other Priority activities

• Operation Excellence

• Accela
  – Phase One – Nursery
  – Phase Two - All other PPPM programs

• Succession Planning!
Thank you.

PPPM Mission Statement –
To protect human health and the environment while fostering a diverse, viable Michigan Agriculture
The Beef Checkoff In Michigan

Producer investment in the Beef Checkoff has not changed in Michigan since 1986 when the Michigan Beef Industry Commission stopped collecting Michigan’s state assessment and began collecting the $1/head national Beef Checkoff. Over time, the number of cattle being assessed has decreased substantially and the inflation-adjusted purchasing power of the $1.00 Beef Checkoff has been reduced to just .42 cents.

The beef industry is facing challenging competition in the marketplace, strong opposition from anti-meat groups, and declining revenue; forcing more opportunities to be left on the table than ever before.

FARM COMMODITY CHECKOFF COMPARISON

<table>
<thead>
<tr>
<th>COMMODITY</th>
<th>RATE</th>
<th>PRODUCER INVESTMENT ON $1,600 IN SALES</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Dairy</td>
<td>$0.15 for every 100 lbs</td>
<td>$17.78 (based on $13.50/cwt.)</td>
</tr>
<tr>
<td>National Soy</td>
<td>$0.50 for every $100 of value</td>
<td>$8.00</td>
</tr>
<tr>
<td>National Pork</td>
<td>$0.40 for every $100 of value</td>
<td>$6.40</td>
</tr>
<tr>
<td>Michigan Corn</td>
<td>$0.01 per bushel</td>
<td>$4.57 (based on $3.50/bu.)</td>
</tr>
<tr>
<td>National Beef</td>
<td>$1 per head</td>
<td>$1.00</td>
</tr>
<tr>
<td>Michigan Beef</td>
<td>$0.10 for every $100 of value</td>
<td>$1.60*</td>
</tr>
</tbody>
</table>

* Represents maximum allowed by law. MBIC can decrease based upon conditions.

In 2015, Michigan cattle producers invested $580,756 in the National Beef Checkoff at $1 per head. By law, half must go to the Cattlemen’s Beef Board to fund national programs, leaving MBIC with $290,370 for state programs.

Quotes from Cattle Producers

30 Years of the Beef Checkoff
"The beef industry has faced challenges like Mad Cow Disease, misinformation from activist groups, and claims that red meat causes cancer. The beef checkoff has protected and defended the industry time and again, but it takes money to get the facts out there. When you look at the $1 per head that started 30 years ago, what else has stayed the same price during that time?"
- Tim Andrews, Sault Ste. Marie

Building Beef Demand
"The beef industry needs to focus on keeping beef on the menu and keeping beef relevant to our consumers. This is done by promotion, consumer information and research. We can’t predict the biggest problem that will confront our industry over the next ten years, but with the right resources we can be ready to tackle it when it happens."
- Dale Oeschger, Bay Port

Practical Solutions
"As dairy producers, we are also beef producers. The national beef checkoff has done a great job, but we feel there is an opportunity to enhance producer input into research that will solve problems we face on the farm. We need practical solutions that make economic sense. The state program will allow producers to guide research that will benefit the beef and dairy industries in Michigan."
- Dan Javor, Hastings
Why Reinject the Program?
- Greater resources are desperately needed to continue building demand for beef.
- Resources would stay in Michigan and would be entirely controlled by Michigan producers.
- The state program would allow MBIC to explore additional marketing opportunities for Michigan beef.
- The state program can help research and address challenges facing Michigan producers.
- The state program would provide resources to address pressing industry issues that may not have surfaced yet.

Purposes and Objectives
- Promote the sale and use of beef and beef products in Michigan.
- Support the beef promotion, research, education, consumer marketing and other activities of the national beef checkoff.
- Conducting scientific research on any or all phases of beef production, marketing or promotion.
- Dissemination of reliable information on the purchase, pricing, identification, care, cookery, serving, nutrition, and economic value of beef and beef products.

MBIC In Action
New Products
MBIC introduces new beef products by demonstrating recipes and distributing samples. Beef value cuts have added $50-70 per head to the beef cutout.

Tours
MBIC holds tours for chefs, dietitians and bloggers to share the facts about beef production in Michigan.

Education
MBIC teaches modern beef cutting methods that result in more convenient, consumer-friendly cuts.

Nutrition
MBIC works with Registered Dietitians to promote the nutritional value of beef in a healthy diet.

Opportunities Left Behind
Young Parents – 74% of young parents prefer to serve their children chicken due to misperceptions about beef.

Advertising – Currently, MBIC focuses only on limited social media strategies.

Issues Management – Resources for challenging misinformation about beef are declining.

Research – Research provides the foundation needed to improve and defend your industry.

Who Handles the Money?
The program would be administered by the existing Michigan Beef Industry Commission. MBIC is composed of 9 voting members appointed by the governor. Voting members include 3 Cattle Feeders, 2 Cow/Calf Producers, 1 Dairy Producer, 1 Packer, 1 Market Representative, and 1 Retailer.


MI Assessment Task Force
Cattle producers representing Michigan’s cow-calf, dairy and feeding segments met to determine the best way to enhance MBIC resources.

Task Force Recommendation
The task force recommends MBIC reinstate assessments under the Michigan Beef Industry Commission Act, PA 291 from the sale of all cattle sold for slaughter or sold to be fed for slaughter.

MBIC should collect the state assessment concurrent with the $1 per head national beef checkoff.

To take this survey online, please visit www.MiBeef.org
MBIC was established in 1972 through Public Act 291 and is composed of 9 voting Commissioners appointed by the Governor.

Assessment: 0.1% of gross

Nine Voting Members:
- 2 Cow-calf producers
- 3 Cattle Feeders
- 1 Dairy Producer
- 1 Livestock Marketer
- 1 Packer Representative
- 1 Retail Representative

The purpose of the Michigan Beef Industry Commission is to build the demand for beef and veal products in order to increase the opportunities for all segments of the beef industry.
$1-per-Head National Checkoff

- Promotion
- Research
- Consumer Information
- Industry Information
- Foreign Marketing
- Producer Communications
Michigan Retail Promotions
Kroger Launches Flat Iron

- National Rollout of the Flat Iron Steak
- In-store demonstrations across Michigan.
Michigan Consumer Outreach
Live a Flavorful Life
https://www.youtube.com/watch?v=P1n9rHZnDnk
## 2016 MBIC Budget

### REVENUES

<table>
<thead>
<tr>
<th>Revenue Type</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Net Assessments</td>
<td>295,000</td>
</tr>
<tr>
<td>Interest</td>
<td>700</td>
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<tr>
<td>Monies from Savings</td>
<td>34,500</td>
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<tr>
<td><strong>Total Revenue</strong></td>
<td><strong>330,200</strong></td>
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### EXPENSES

<table>
<thead>
<tr>
<th>Expense Type</th>
<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>Promotion</td>
<td>66,287</td>
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<tr>
<td>Consumer Info</td>
<td>68,212</td>
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<tr>
<td>Industry Info</td>
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<tr>
<td>Producer Comm.</td>
<td>41,740</td>
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<td>Collection &amp; Compliance</td>
<td>24,390</td>
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<tr>
<td>Administration</td>
<td>52,379</td>
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<tr>
<td>Federation Investment</td>
<td>36,000</td>
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<tr>
<td><strong>Total Expenses</strong></td>
<td><strong>330,200</strong></td>
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</tbody>
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# Buying Power of the Dollar Through the Years

<table>
<thead>
<tr>
<th>Item</th>
<th>Average Cost in 1986</th>
<th>Average Cost 2015</th>
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</thead>
<tbody>
<tr>
<td>Pound of ground beef</td>
<td>$1.29</td>
<td>$5.15</td>
</tr>
<tr>
<td>Movie ticket</td>
<td>$3.71</td>
<td>$8.08</td>
</tr>
<tr>
<td>Average rent</td>
<td>$385</td>
<td>$1,150</td>
</tr>
<tr>
<td>Base cost of a half-ton pick-up truck <em>(before options)</em></td>
<td>$10,677</td>
<td>$34,795</td>
</tr>
<tr>
<td>Average home price</td>
<td>$89,430</td>
<td>$313,200</td>
</tr>
<tr>
<td>Beef checkoff assessment</td>
<td>$1 per head</td>
<td>$1 per head</td>
</tr>
</tbody>
</table>

- $1 now has the buying power of $0.42
Task Force Recommendation

MI Assessment Task Force
Cattle producers representing Michigan’s cow-calf, dairy and feeding segments met to determine the best way to enhance MBIC resources.

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Supported by: MCA, MMPA, DFA, MI Farm Bureau

MBIC Voting Members:
Dale Oeschger
Jill Sears
Bret Schapman
Jon Haindl
Garry Wiley
Leonard Brown
John VanderBoon
Scott Acker
Hal Neiman
Purposes and Objectives

• Promote the sale and use of beef
• Support promotion, research, education, consumer marketing and other beef checkoff activities.
• Scientific Research on any and all phases of beef production, marketing or promotion.
• Dissemination of reliable information about beef.
Your Opinion IS Important

MBIC is Seeking Producer input through an outreach and survey campaign.

MBIC will examine survey results in April.

If producers support the recommendation, assessments could begin October 1, 2016.
Input Sought at Public Hearings, Producer Meetings, Industry Events

- January 19 – Cattle Feeder Shortcourse, E. Lansing
- January 21 – Cattle Feeder Shortcourse, Bad Axe
- January 27 - MSU Extension Regional Beef Meeting, Paris
- February 2 – MSU Extension Regional Beef Meeting, Escanaba
- February 3 - Thumb Cattlemen Meeting, Bad Axe
- February 3 – MSU Extension Regional Beef Meeting, Rudyard
- February 4 – MSU Extension Regional Beef Meeting, Ontonagon
- February 13 - MCA Annual Conference, E. Lansing
- February 17 - MSU Extension Regional Beef Meeting, Ionia
- February 24 – Michigan Agriculture Commission, E. Lansing
- March 10 – Great Lakes Forage and Grazing Conference, E. Lansing
- March 11 – MDARD Public Hearing, Doherty Hotel, Clare, MI
- March 15 – MDARD Public Hearing, Hampton Inn, Marshall, MI
- March 17 – MSU Extension Dairy Advisory Meeting, St. Johns
- March 17 – MSU Extension Regional Beef Meeting, MMCC, Clare
- March 23 – Michigan Milk Producers Delegate Meeting, Lansing
- April 1-2 – Michigan Beef Expo, E. Lansing
PLEASE!!
Complete & Return the Producer Survey

Survey also available at www.MIBEEF.org