



(Illinois-Indiana Sea Grant Photo/Hope Charters)

#### AUTHORS

Stuart Carlton  
Amy Shambach  
Carolyn Foley

## Walleye Aquaculture Working Group Workshop: Identifying Walleye Marketing and Production Barriers

### Introduction<sup>1</sup>

Illinois-Indiana Sea Grant (IISG) is working to support the development of a sustainable regional aquaculture market through various research, outreach, and education activities. These efforts focus on fish species that are currently produced in the bi-state region, many of which are non-native and don't have a strong association with the Midwest. Research and anecdotal evidence suggest that farmed fish with a stronger local identity may be more successful in the marketplace because it is more familiar to Midwesterners as a local, native fish as opposed to the exotic species that are currently the focus of regional aquaculture.<sup>2</sup>

Walleye is one such fish: it has a strong association with the Midwest, is available in restaurants as a commercially caught species, and may be suitable for aquaculture. However, there is currently minimal walleye aquaculture in Illinois or Indiana.

The business and real-world production barriers to developing walleye aquaculture are not fully understood, but they include technical barriers to raising the fish in an economically sustainable manner, challenges inherent in developing new markets, policy barriers, and more. Simply put, there is reason to believe that walleye aquaculture could be successful, but there is a lot of background work that needs to be done to see if it is even feasible.



**Figure 1.** Members of the inaugural Walleye Aquaculture Working Group discuss different barriers to systematic walleye production. (Illinois-Indiana Sea Grant Photo/Hope Charters)

To help with this background work, IISG formed the Walleye Aquaculture Working Group (WAWG), a multi-disciplinary team of aquaculture producers, natural scientists, social scientists, regulators, and other interested stakeholders from throughout the Midwest. The long-term goal of the WAWG is to facilitate the development of a successful farmed walleye market in Illinois and Indiana. The purpose of this initial WAWG meeting was to identify and prioritize potential barriers and knowledge gaps related to developing a sustainable farmed walleye aquaculture market.

## Workshop attendees and format

The initial Walleye Aquaculture Working Group meeting was held on January 7, 2020, at Purdue University. The meeting was facilitated by WAWG project lead Dr. Stuart Carlton and was attended by WAWG project team members Dr. Kwamena Quagraine, Bob Rode, Andy Coursey, Carolyn Foley, Dr. Tomas Höök, and Amy Shambach. The meeting was also attended by approximately 20 WAWG stakeholders who work in aquaculture production, research, and regulation in Illinois, Indiana, and the Midwest.

During the workshop, WAWG members and stakeholders participated in a series of individual and group activities designed to elucidate *key production and marketing-related barriers* to developing a sustainable walleye aquaculture market in Illinois and Indiana.<sup>3</sup> After discussion, the group took an informal sticky-dot vote in which each participant received 3 votes to rank the barriers by importance.

These barriers will be used by WAWG members to identify research questions to begin to address the overall question of whether or not this region can support a sustainable walleye aquaculture market.

## Production barriers

The group identified a number of potential barriers and research questions related to walleye production, which are presented in Table 1. The top-rated issues are briefly described on the next page in descending order of group-identified priority.

Item	Total votes
Fingerling supply	12
Broodstock domestication	11
Production cost	8
Egg supply	7
Year-round production	6
Feed training	6
Growth rates compared to existing species	5
Disease resistance/susceptibility	4
System types (Pond/RAS/Cage)	3
Water quality needs	2
Market-size of the fish	2
Saugeye vs walleye tradeoffs	2
Nutritional needs	1
Light levels	1
Late sexual maturation	1
Dress-out percentage	0
Knowledge barriers	0
Stocking density/biomass	0
Temperature requirements	0
Geographic farm location	0

**Table 1.** Production Barriers to Walleye Aquaculture Success

**Fingerling supply:** In order to produce fish in a profitable manner, there needs to be a consistent supply of fingerlings. There isn't currently a walleye fingerling supplier for aquaculture producers in the Midwest. Walleye fingerlings are grown for stocking purposes by the Indiana DNR, but current resources likely would not allow for these fingerlings to be used for aquaculture.

**Broodstock domestication:** Potential fingerling suppliers need broodstock to produce fingerlings for the market. It isn't currently clear that broodstock can be successfully domesticated on the scale and cost required to produce an affordable supply of fingerlings.

**Production cost:** At this point, we don't know how much walleye will cost a farmer to produce and bring to market, which makes it difficult to project profitability.

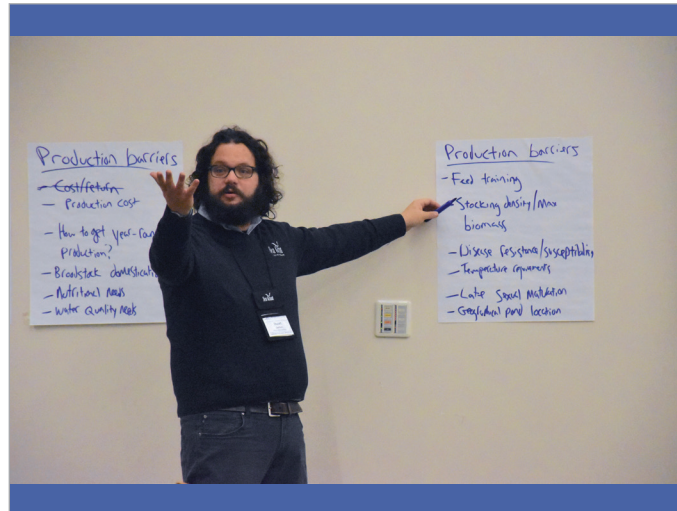
**Egg supply:** Potential fingerling suppliers need eggs to grow into fingerlings, either from domesticated broodstock or from some other source. There currently is no consistent source of egg supply for a potential fingerling supplier.

**Year-round production:** Typically, consumer markets for fish and animal protein are year-round markets. Is it possible to produce walleye year-round as it is with tilapia, or are they strictly a seasonal fish?

**Feed training:** Farmed fish need to be trained to eat the food that they're fed, which is different than the food that the fish eat in the wild. Walleye would need to be feed-trained to be produced economically; there may be a need for research into feed training methods if existing methods are insufficient.

**Growth rates compared to existing species:** Walleye are a cold-water fish that may have much slower growth rates than fish currently being grown in aquaculture facilities. How do walleye grow compared to other farmed fish species? The growth rate helps to determine how long before the fish can be brought to market, which affects profitability.

**Disease resistance/susceptibility:** Different fish species have different susceptibility to diseases in aquaculture settings. How resistant are walleye?



**Figure 2.** Dr. Stuart Carlton solicits questions about stocking density as a potential barrier to walleye production. (Illinois-Indiana Sea Grant Photo/Hope Charters)

**System type (Pond/RAS/Cage):** In Illinois and Indiana, farmers use pond aquaculture (which is the dominant system in Illinois), recirculating air system (RAS) aquaculture (which dominates Indiana), cage culture, hydroponics, and potentially other systems for growing fish. How do these systems differ? Is walleye suitable for each type?

## Marketing barriers

The group identified a number of potential barriers and research questions related to bringing walleye to market, which are presented in Table 2. The top-rated issues are briefly described below.

**Processing:** There are currently no identified processors for farmed walleye in Illinois or Indiana. Without processors, farmers have no easy way to sell walleye fillets.

**Competing with wild market for demand:** There is currently a small wild-caught walleye market in the region. Can farmed walleye compete with the wild-caught market? Can farmed walleye expand the existing market? How would the introduction of farmed raised walleye affect market prices?

**Market price:** What is the price that consumers are willing pay for walleye? Is it high enough for farmers to make a profit?



**What size fish?:** What size fish are the right size for the market? How long does it take walleye to grow to that size in ponds? How long does it take walleye to grow to that size in indoor recirculating systems? Does this vary for the live versus processed fish market?

Item	Total votes
Processing	9
Competing with wild market for demand	9
What size fish?	8
Market price	5
Necessary price?	4
Will buyers pay more?	3
No established market for farmed fish food (food walleye)	3
Market size and location	3
Consumer perception	3
Sensory tests	1
Mislabeling	1
Fingerling supply...who does this?	1
Farmed vs wild	1
Does seasonality kill marketability?	1
Biochemically	1
Will walleye haul and hold into a live market	0
Why is walleye different?	0
What is the profit point?	0
VHS testing	0
Regulations/regulatory environment	0
Regulations for getting eggs	0
Recreational market competition	0
Processed	0
Market growth vs replacing other fish	0
Market fluctuations	0
Locally produced?	0
Is the live fish market big enough?	0
How important is year round production and harvest?	0
Consumer perception	0
Competition for fingerlings	0
Competing with wild-caught in terms of price	0
Can we tie into midwestern identity?	0
Bioaccumulation of toxins	0

**Table 2.** Marketing Barriers to Walleye Aquaculture Success

**Necessary price?:** What is the minimum price that farmers need consumers to pay in order to profitably grow and sell walleye? How does it compare to the market price?

**Will buyers pay more?:** Will buyers pay more for walleye than for other fish that farmers might grow? If not, then why would farmers grow walleye instead of a different species? Does labelling the fish as “locally produced” make a difference?

**No established market for farmed food walleye:** This is a brand-new product with no established market. Will consumers even be interested in farmed walleye?

**Market size and location:** How big is the potential market? A bigger market is more likely to be sustainable than a smaller market. Where is the market located? Is it close enough to farms that the farmers and distributors can get their fish to the market?

**Consumer perception:** We assume that consumers think of walleye as a high-value fish with a Midwestern identity. Is this true? Do consumers value these traits enough to pay a premium for locally farmed walleye?

### Endnotes

1 The introduction is adapted from original Walleye Aquaculture Working Group grant proposal.

2 Quagraine, K., Hart, S. and Brown, P., 2008. Consumer acceptance of locally grown food: The case of Indiana aquaculture products. *Aquaculture Economics & Management*, 12(1), pp.54-70.

3 During the discussion, it became clear that the difference between production and marketing-related barriers isn't always clear. We categorized barriers as best as we could.

