

***Efficacy of hydrogen peroxide to
control Saprolegniasis on cool-
and warmwater fish eggs***

**Hydrogen peroxide INAD 10-023
(Perox-Aid™)**

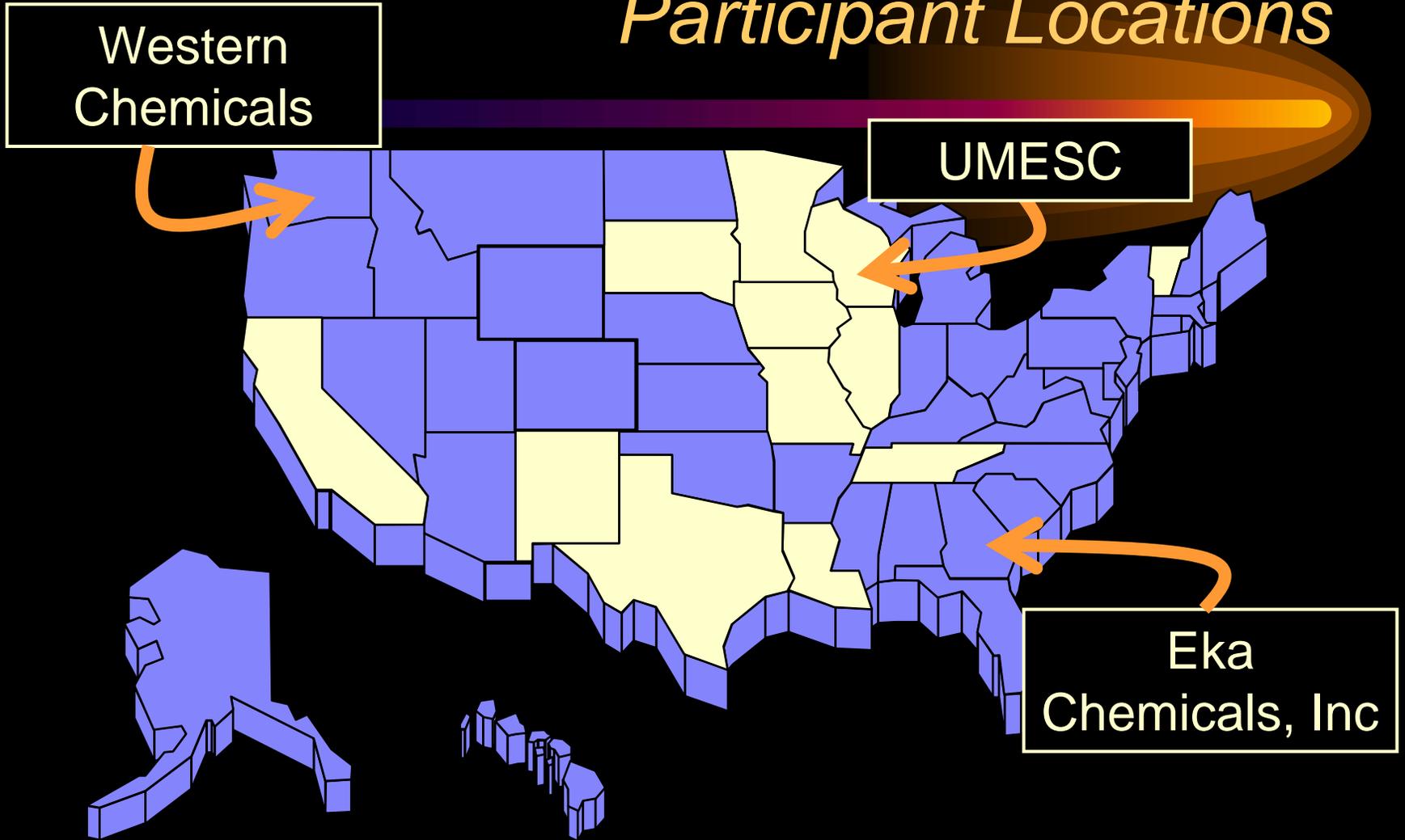


Egg Efficacy Trial Participants

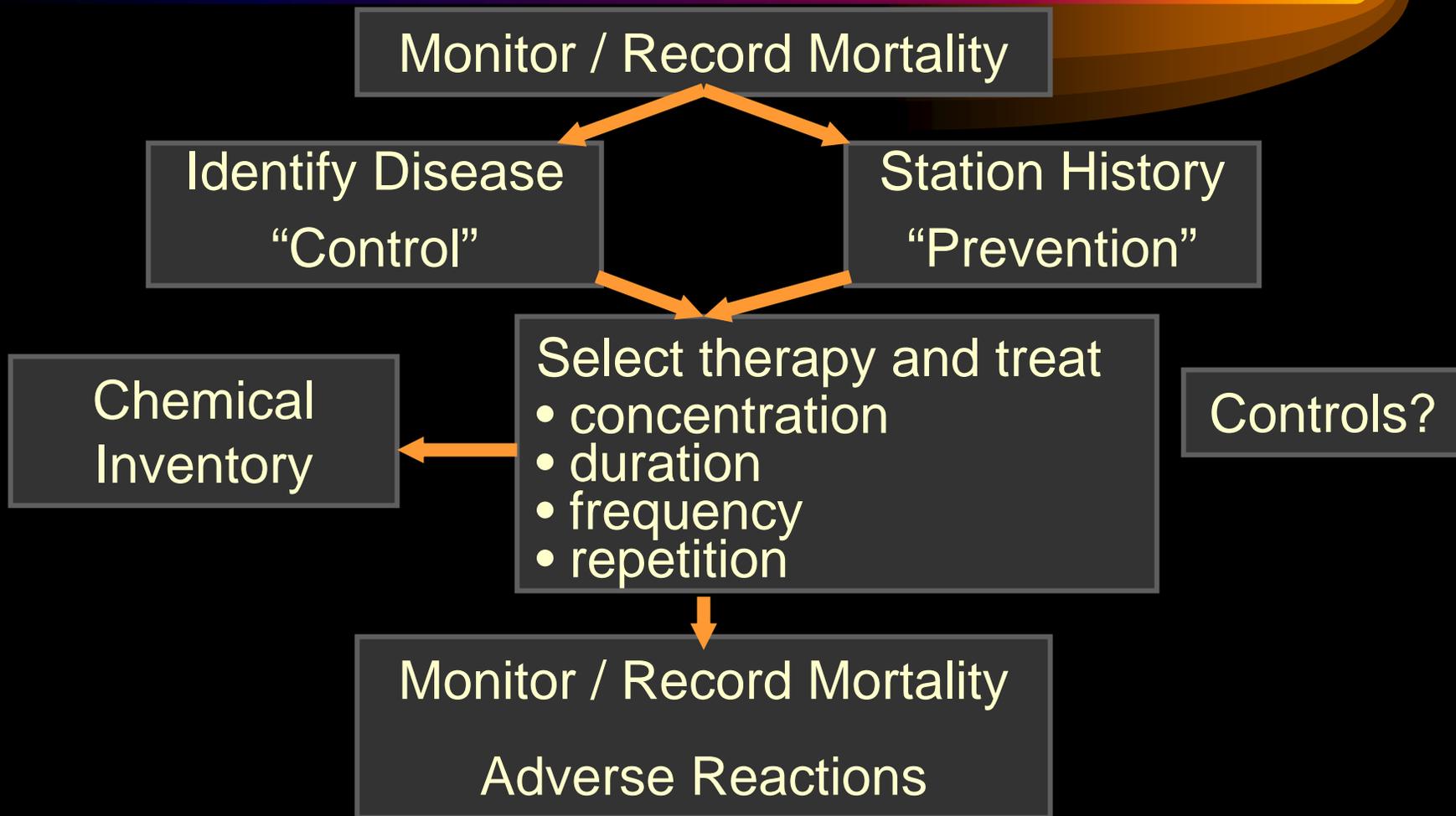
- Mark Drobish – Gavins Point NFH
- Lynn Lee – UMESC
- Andy Moore – Rathbun Research
- Clark Moen – Blue Dog SFH
- Tom Harder – Max McGraw
- Dennis Smith – Dundee SFH
- Jerry Hamilton – Blind Pony SFH

- Study CAP-00-FUNGUS
 - submitted to CVM 03 March 2000
 - **Twenty-nine** participating facilities
- Study CAP-00-PARASITES
 - submitted to CVM 18 April 2000
 - **Twenty-one** participating facilities
- Study CAP-00-BACTERIA
 - submitted to CVM 18 April 2000
 - **Twenty-three** participating facilities

Participant Locations



Protocol Methods



Hydrogen peroxide therapy - Fish

- Duration: 30 or 60 min
- Concentration
 - 50, 75, or 100 mg/L for 60 min
 - 100 or 150 mg/L for 30 min
- Repetition/Interval: once daily on consecutive or alternate days for up to 10 treatments.

Hydrogen peroxide therapy - Eggs

- Duration: 15 min
- Concentration: 500 or 750 mg/L
 - minimum incubator concentration is 500 mg/L for 15 min
- Repetition/Interval: Once daily on consecutive or alternate days through hatch

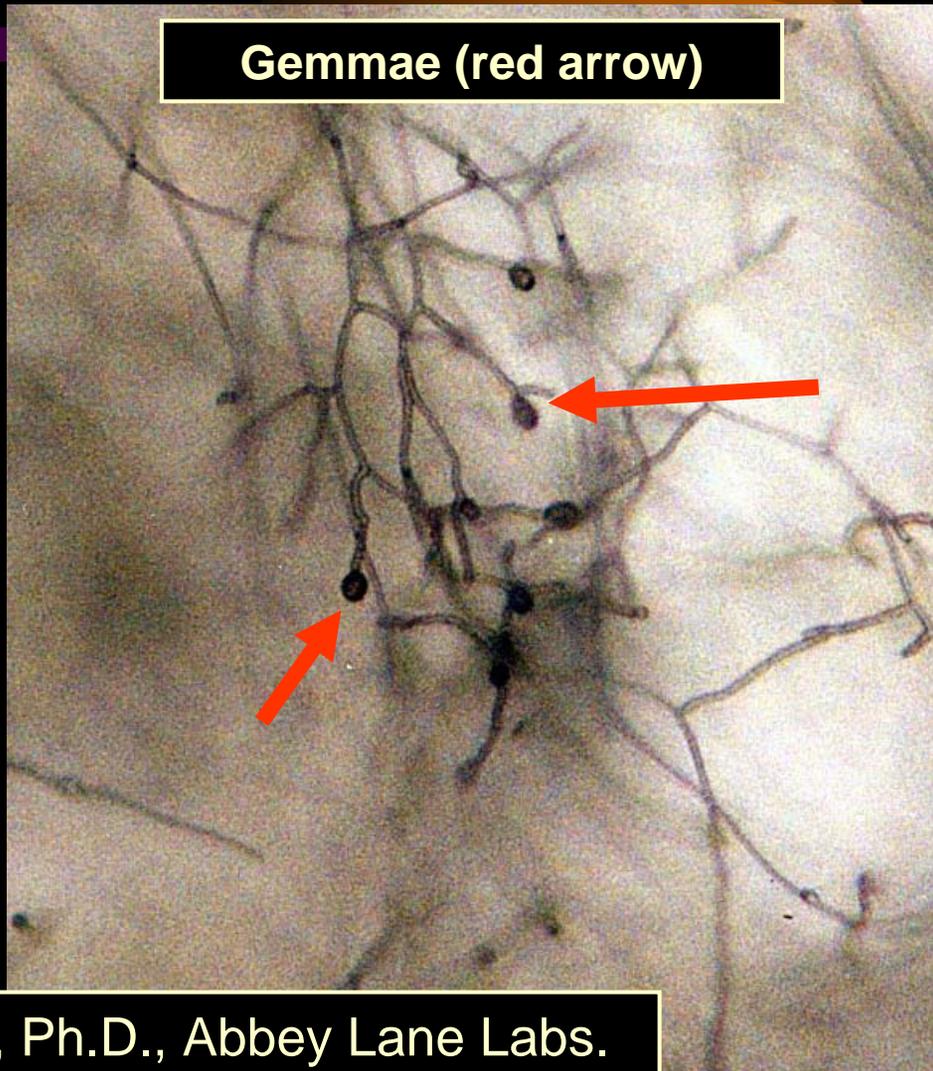
Egg Efficacy Trials

- Seven egg efficacy trials conducted
 - Blind Pony SFH, Jerry Hamilton, paddlefish
 - Blue Dog SFH, Clark Moen, walleye
 - Dundee SFH, Dennis Smith, smallmouth bass
 - Gavins Point NFH, Mark Drobish, walleye
 - Max McGraw, Tom Harder, walleye
 - Rathbun SFH, Alan Moore, channel catfish
 - UMESC, Lynn Lee, walleye
- Fungus identified in three trials

Saprolegnia parasitica



**Zoospores in
zoosporangium
(blue arrow)**



Gemmae (red arrow)

Blind Pony SFH - paddlefish

- Temperature 15 - 16°C
- Four trials - one or two females per trial
 - 500, 750, or 1000 mg/L
 - % hatch ranged from 14 - 56% (of fertile eggs)
 - 2 - 4 consecutive treatments; fungus in all treated jars
 - noted cessation of egg development after hydrogen peroxide treatment
 - withholding treatments until 2 d post fertilization resulted in basically no hatch
 - compared rolling w/o treatment to hydrogen peroxide treatment w/o rolling
 - rolled eggs - 60% hatch treated eggs 24% hatch

Blind Pony - paddlefish *Saprolegnia ferax*



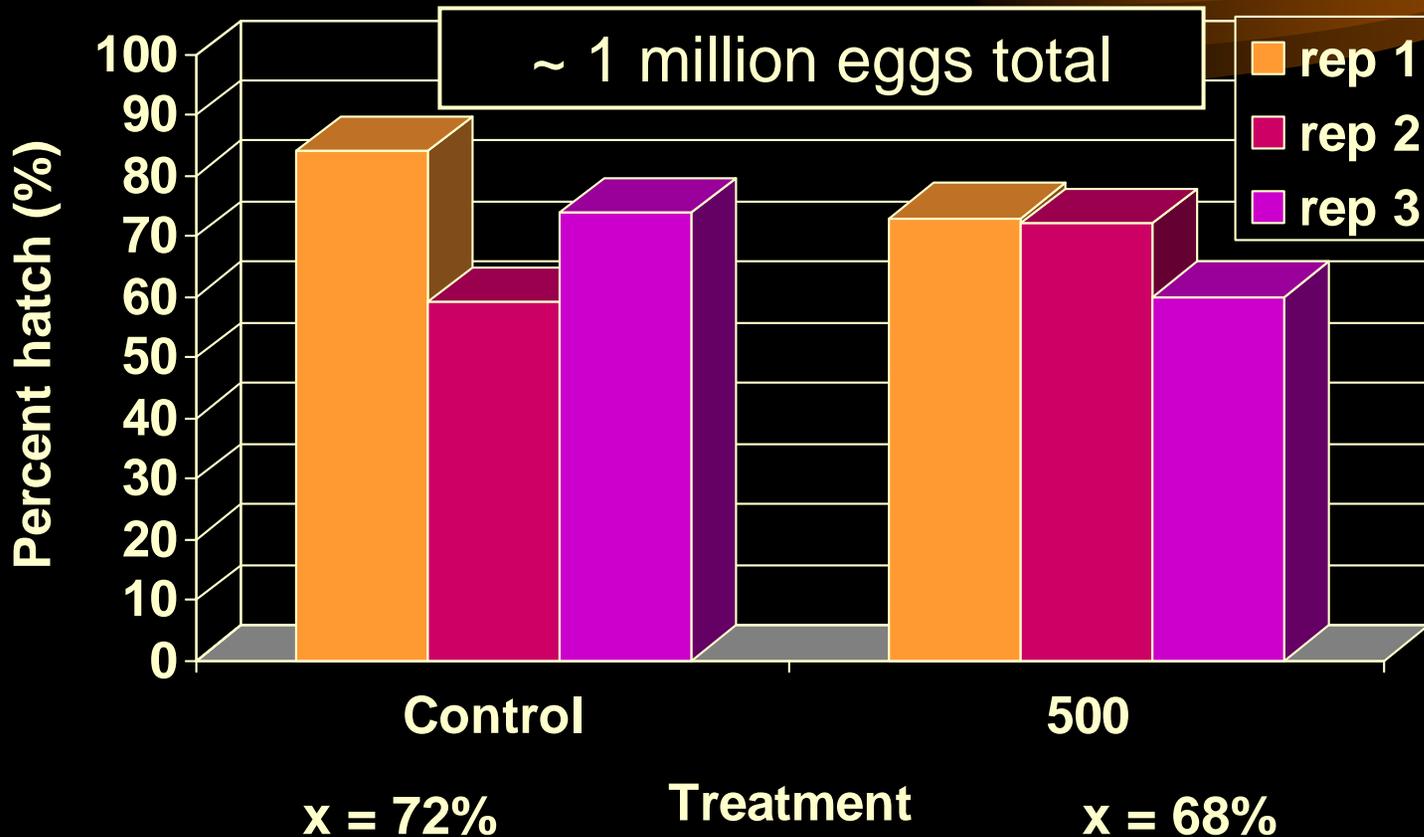
Oogonium with oospores showing cell wall pitting.



Oogonia and gemmae from sterile house fly culture.

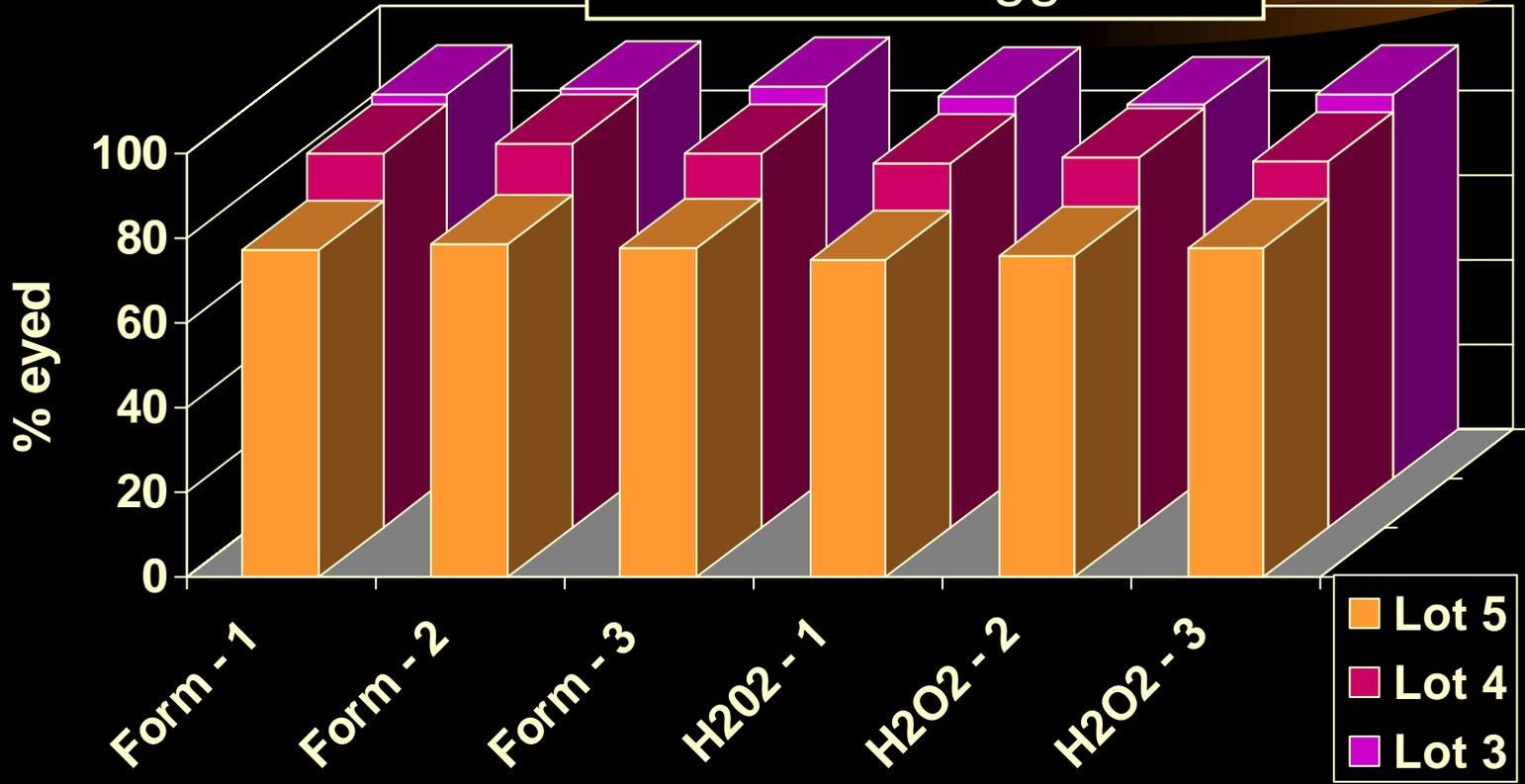
Photo credit: Steve Carpenter, Ph.D., Abbey Lane Labs.

Max McGraw - walleye



Blue Dog SFH - walleye

~1.5 million eggs total



Gavins Point NFH - walleye

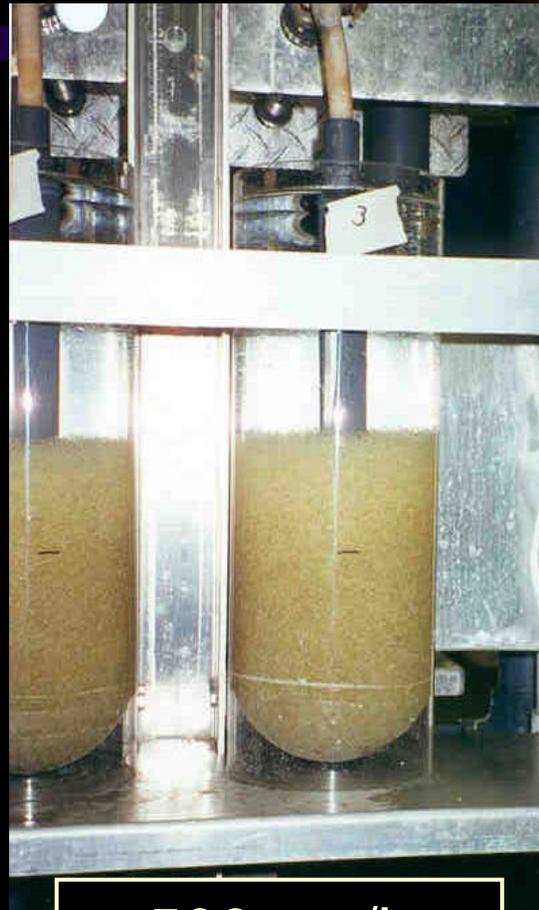
~3.1 million eggs total



Gavins Point NFH - walleye



Control



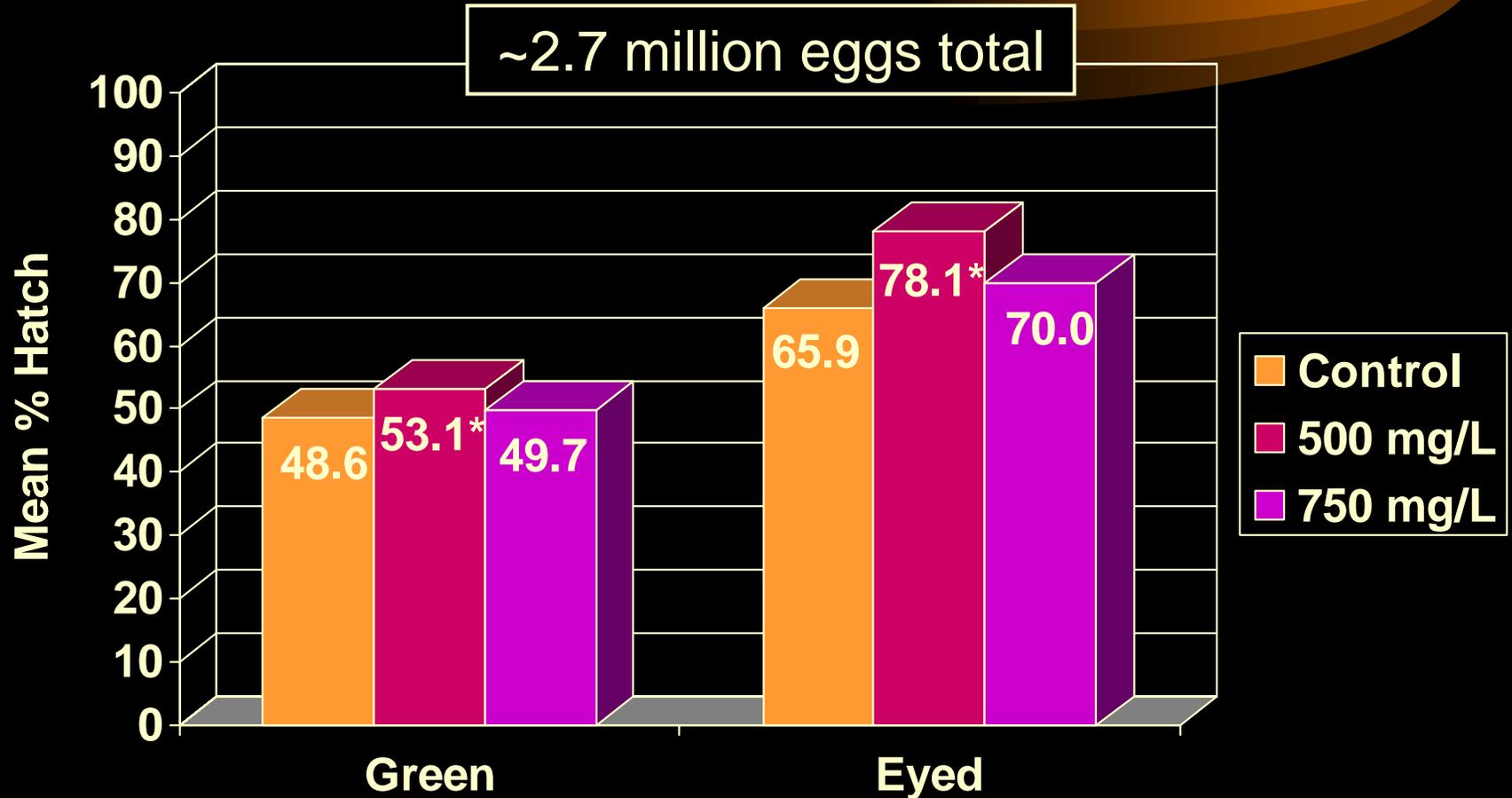
500 mg/L



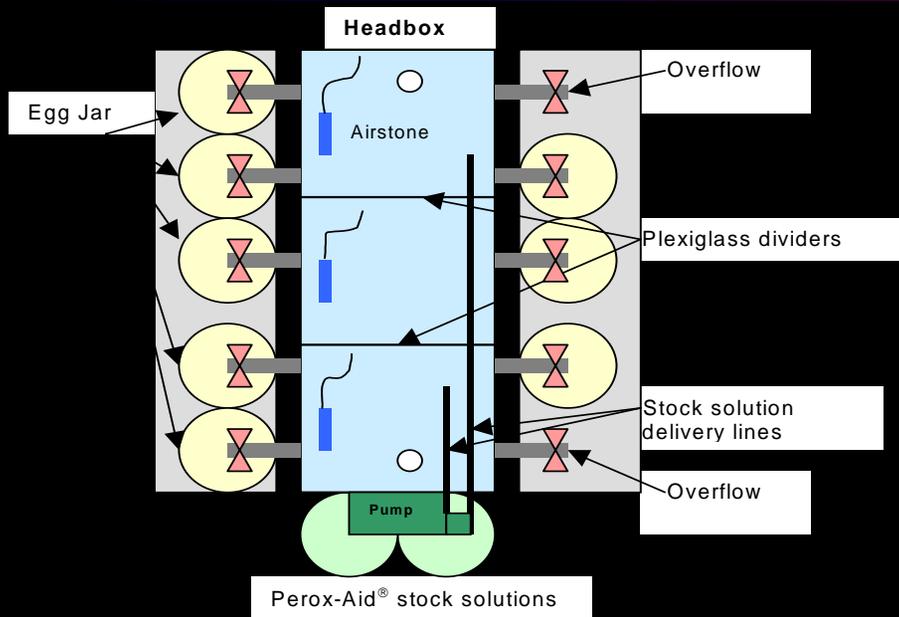
750 mg/L

Photo credit: Mark Drobish, Gavins Point NFH

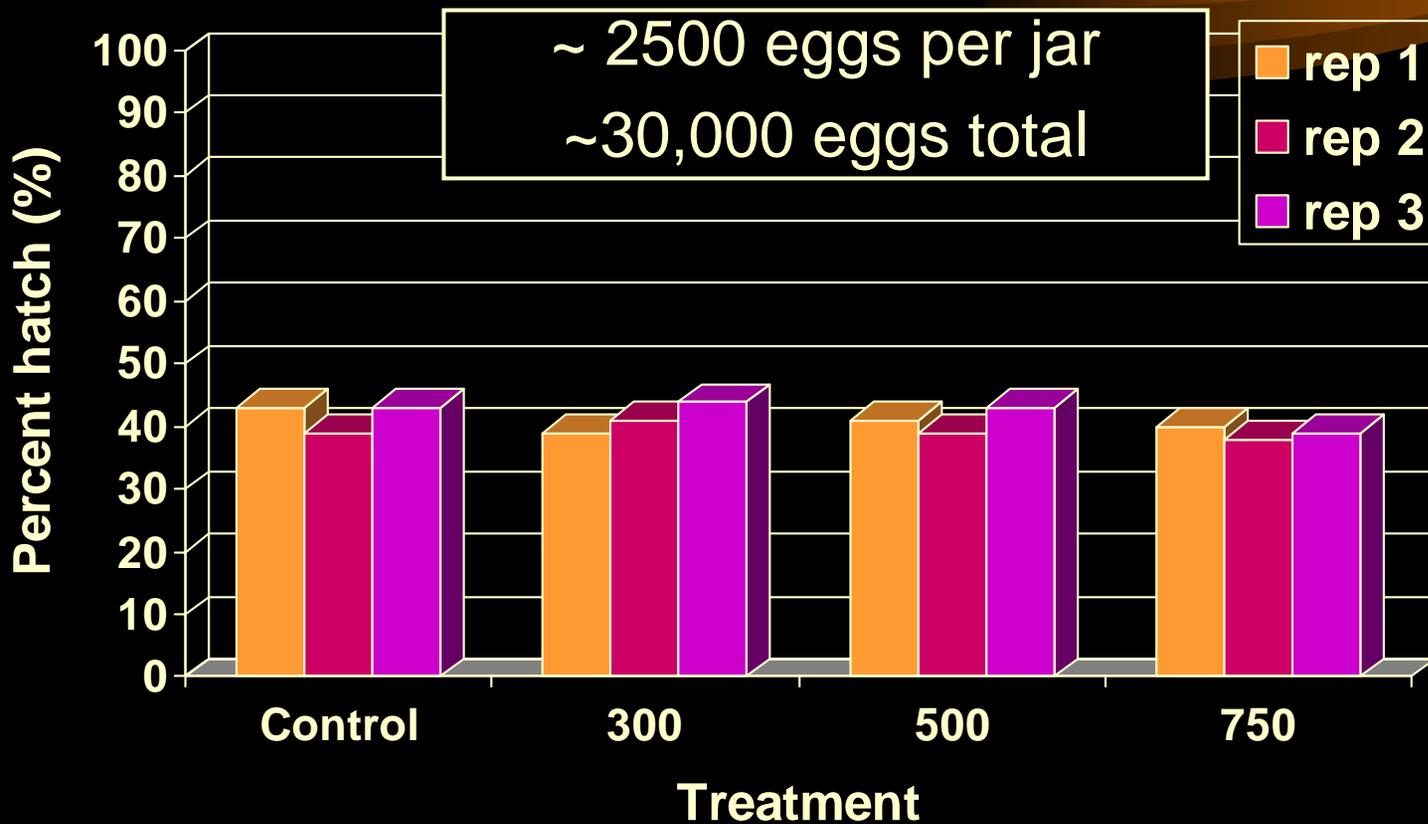
UMESC - walleye



UMESC - Walleye

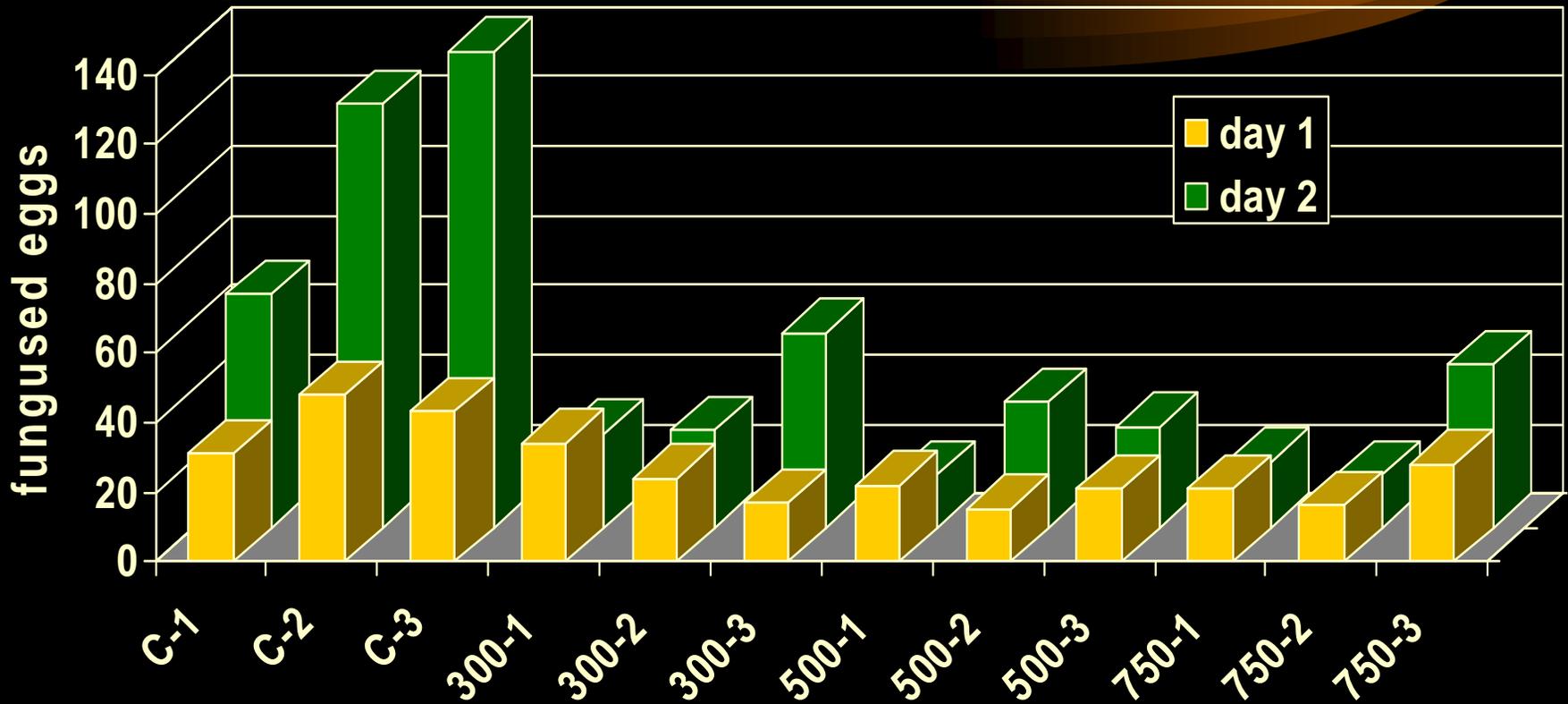


Dundee SFH - smallmouth bass eggs

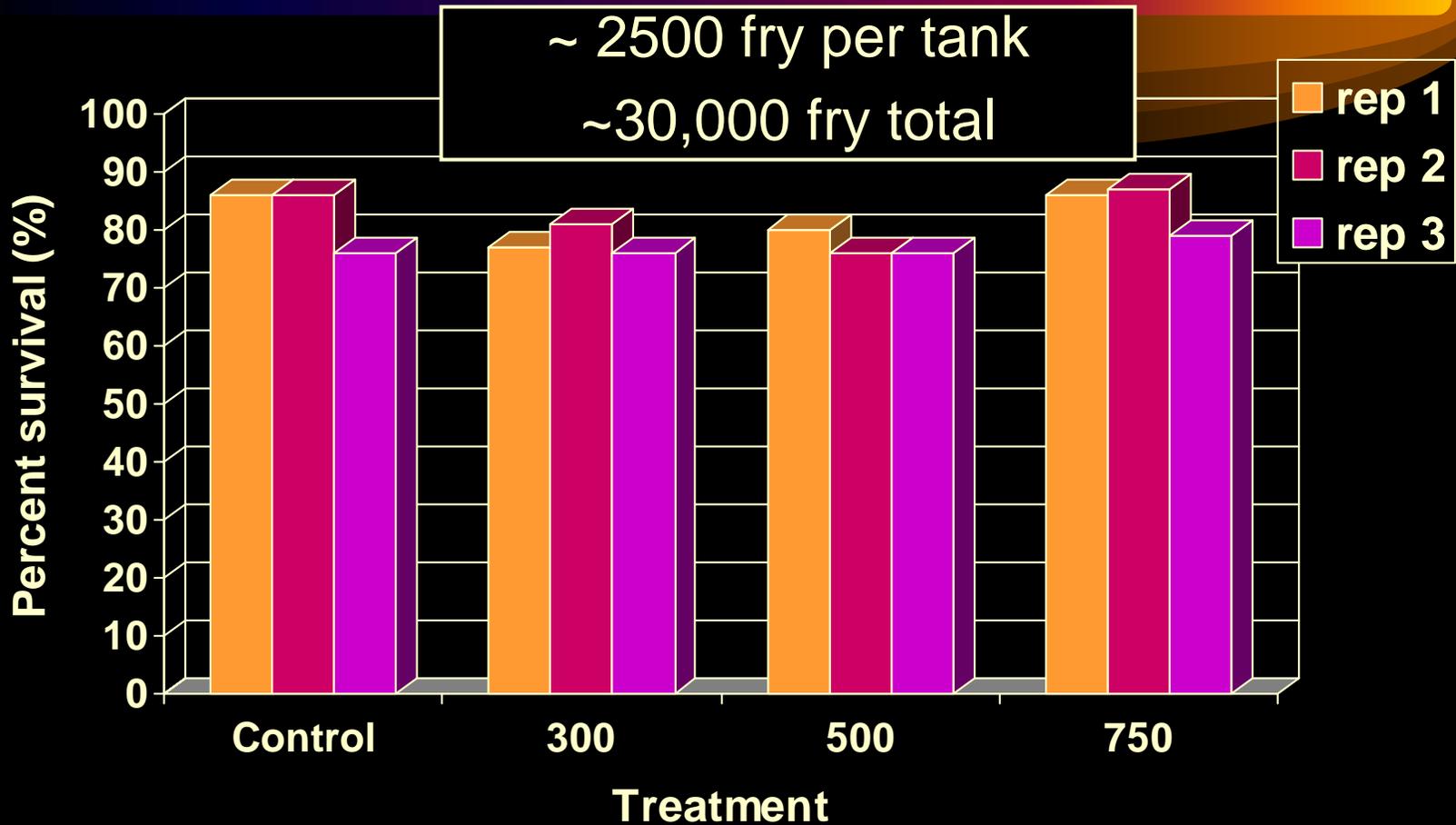


Dundee SFH - smallmouth bass eggs

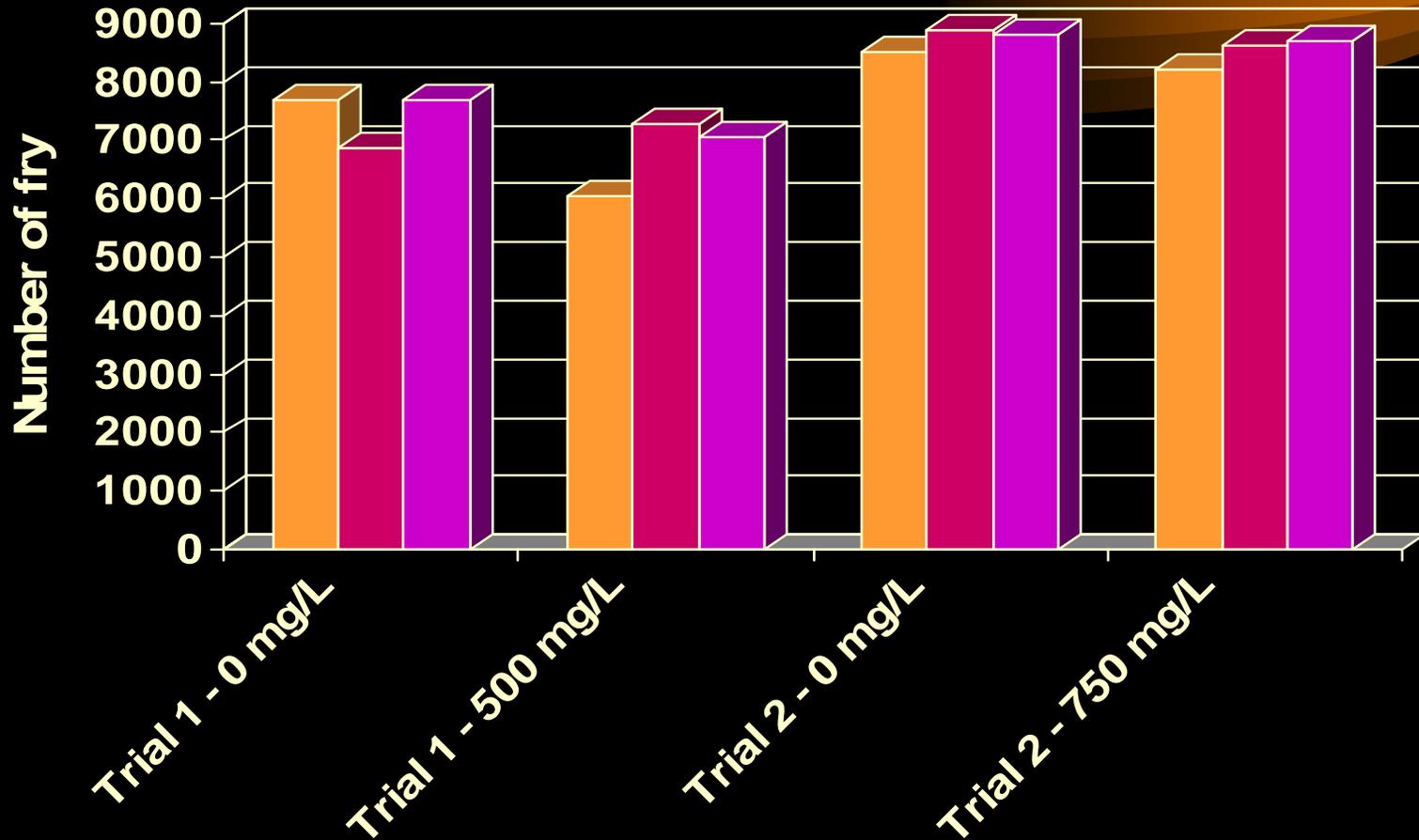
Number of fungused eggs removed during incubation.



Dundee SFH - smallmouth bass fry



Rathbun SFH - channel catfish eggs



Rathbun SFH - channel catfish control eggs

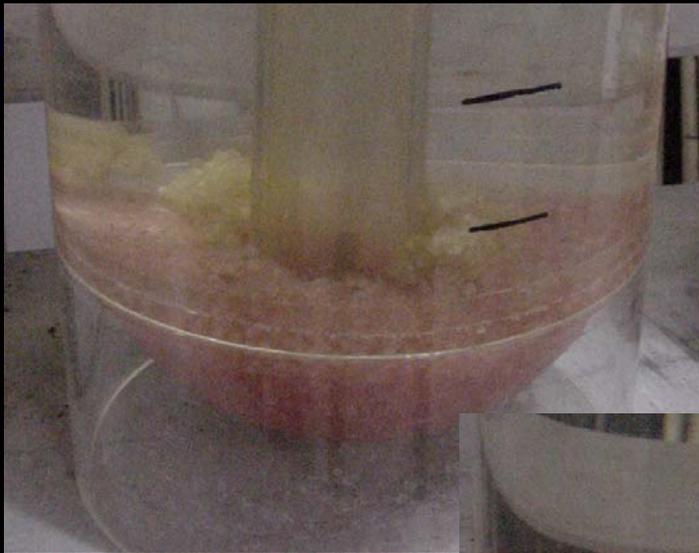


Photo credit: Andy Moore, Rathbun SFH

Rathbun SFH - channel catfish treated eggs

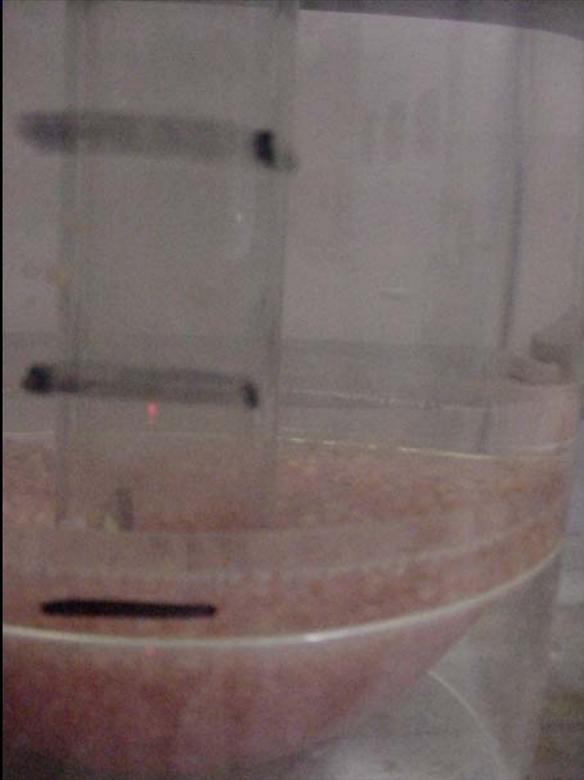


Photo credit: Andy Moore, Rathbun SFH

Conclusions

- A hydrogen peroxide treatment regimen of 500 mg/L administered for 15 min on consecutive days from incubation to hatch is effective in controlling fungus on walleye and channel catfish eggs.
- Hydrogen peroxide virtually eliminated fungal growth in both walleye and channel catfish eggs and increased the probability of walleye hatch in two of three controlled trials.