UNIVERSITY OF IDAHO
HAGEMAN FISH CULTURE
EXPERIMENT STATION

Brian C. Small, Professor & Director
SOUTHERN IDAHO AQUACULTURE

~ 17 of approx. 50 Idaho agency & tribal hatcheries
SOUTHERN IDAHO AQUACULTURE

~70 commercial farms

Trout, tilapia, sturgeon, catfish, pacific salmon, frogs, aquarium fish

5 processing plants, 2 feed mills, 1 equipment manufacturer

~$175 million annually in production/processing value

Directly employs ~500 people in the Magic Valley
MAGIC VALLEY WATER

*Constant supply of spring water

✓ Cool, clean & 100% oxygen saturated
✓ 2200 cfs & 59°F
✓ Gravity fed and non-consumptive

*Geothermal artesian wells

✓ 90 – 110°F
COMMERCIAL TROUT PRODUCTION

*US production ~ 60 million pounds ($115M)

~ 425 million eggs sold in the US ($21M)

$112.85 million trade deficit in 2017

*Idaho production ~70% of US

~40 million pounds
ARI-HAGERMAN FISH CULTURE EXPERIMENT STATION

University of Idaho
HAGERMAN FISH CULTURE EXPERIMENT STATION
Aquaculture Research Institute
USDA Agriculture Research Service
Columbia River Inter-Tribal Fish Commission
ARI - Hagerman Fish Culture Experiment Station (HFCES)

- 6000 ft² wet lab...1st-use spring water
- 2000 gpm...14.5°C...gravity-fed
- High replication systems
HFCES – Analytical Labs

- ARI Nutritional Service Center
- Biochemical/physiology assays
- Histology
- Genetics/genomics
- Nextgen sequencing
HFCES
CURRENT RESEARCH AREAS

• Selective Breeding
• Genetics/Genomics
• Fish Nutrition
• Fish Physiology
• Microbiome
SELECTIVE BREEDING

- Growth and production efficiency on plant protein-based feeds
- Increased fillet omega-3 fatty acids
- Genetic/genomic characterization of traits
USDA TROUT-GRAINS PROJECT

- Improve the sustainability and production efficiency of rainbow trout
- Better fish and improved grains
CONSERVATION GENETICS/GENOMICS

• Idaho EPSCoR GEM3
  – Genes to Environment: Modeling, Mechanisms, and Mapping (GEM3)
  – Predict how species adapt to external stressors and a changing environment
  – Translate knowledge into evidenced-based resource management practices
1) Genetic effects of hatchery practices

2) Genetic adaptation to local environments

3) Genetic tagging and monitoring of fisheries

4) Genetic variation of Pacific lamprey and white sturgeon
FISH NUTRITION

- Trout, tilapia, salmon, others
- Nutritional requirements
- Nutritional physiology
- Ingredient evaluations
- Contractual studies
FISH PHYSIOLOGY

- Wellbeing
  - Nutrition
  - Growth
  - Stress
  - Endocrinology

- Gut function
  - Appetite
  - Metabolism
  - Microbial ecology
MICROBIOME

- Nutrient utilization
- Metabolism
- Gut & mucosal health
- Immune function
- Prebiotics
- Direct fed microbials

Ref: Butt and Volkoff (2019)
OUTREACH/EXTENSION
STUDENTS & VISITING SCHOLARS
2018-2019 HFCES AQUACULTURE TEAM

Thank you!