Institute for Experimental Pathology, University of Iceland
Keldur, Reykjavík

# The effects of growth, salinity and temperature on humoral parameters of Atlantic cod

**Bergljót Magnadóttir[1], Björn Þrándur Björnsson[2], Björn Björnsson[3], Agnar Steinarsson[3] & Tómas Árnason[3]**

1) The Instiute for Experimental Pathology, University of Iceland,
2) The Department of Zoology, University of Gothenburgh,
3) The Marine Research Instiute,

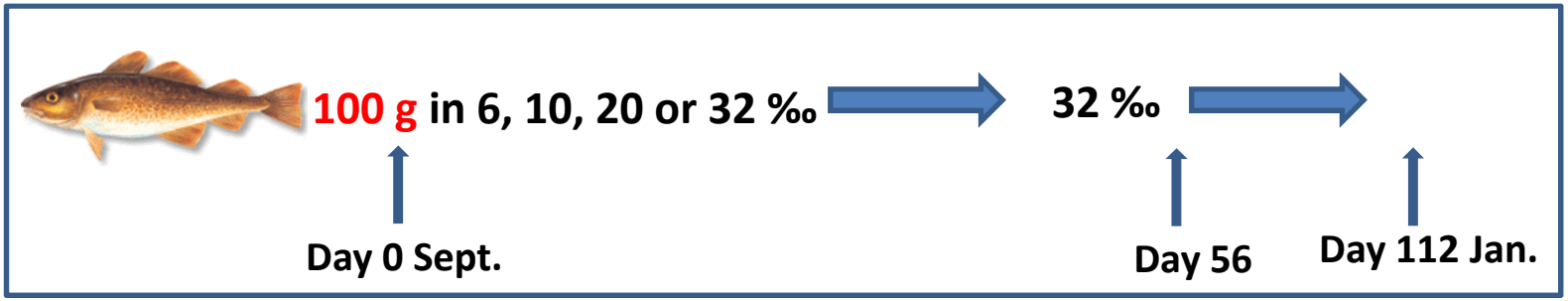
Cod Farming in the Nordic Countries
Grand Hotel, Reykjavík
21 September 2011

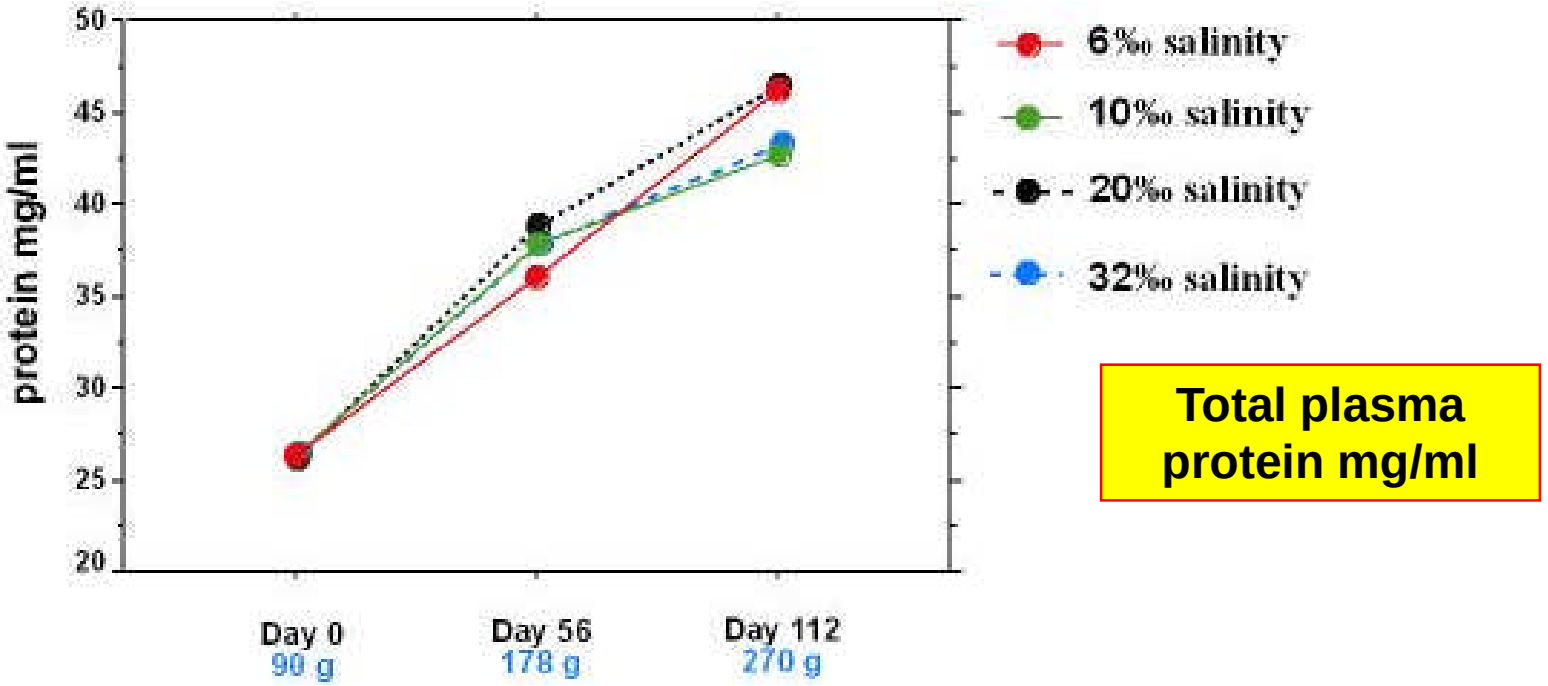
# Analysis of cod plasma

- **Total plasma protein**
  - General information about health and feeding regimes
- **Natural antibody activity**
  - Relatively high in cod and affected by external and inherent factors
- **Anti-protease activity**
  - Important parameter in defence against bacterial infections

**In general: High values are good, low values can be sighns of stress, infection or other pressures on the immune system**

# Experiment 1: Large fish

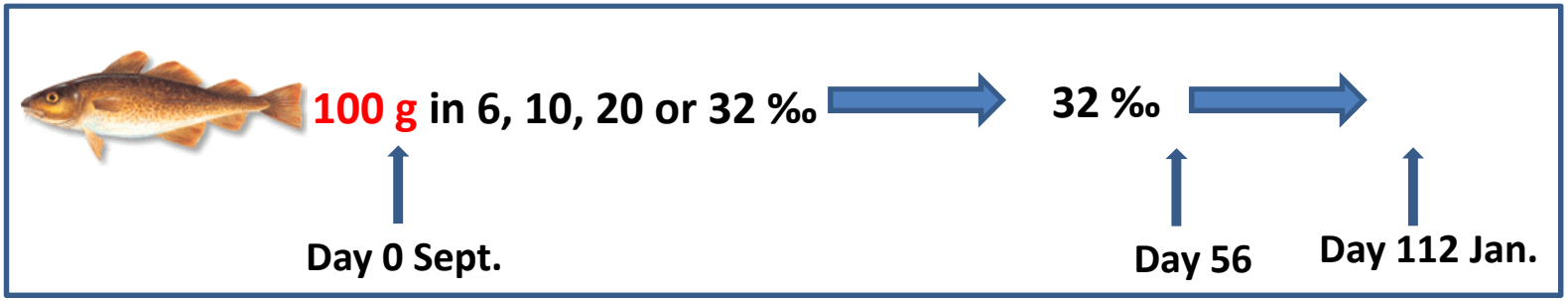


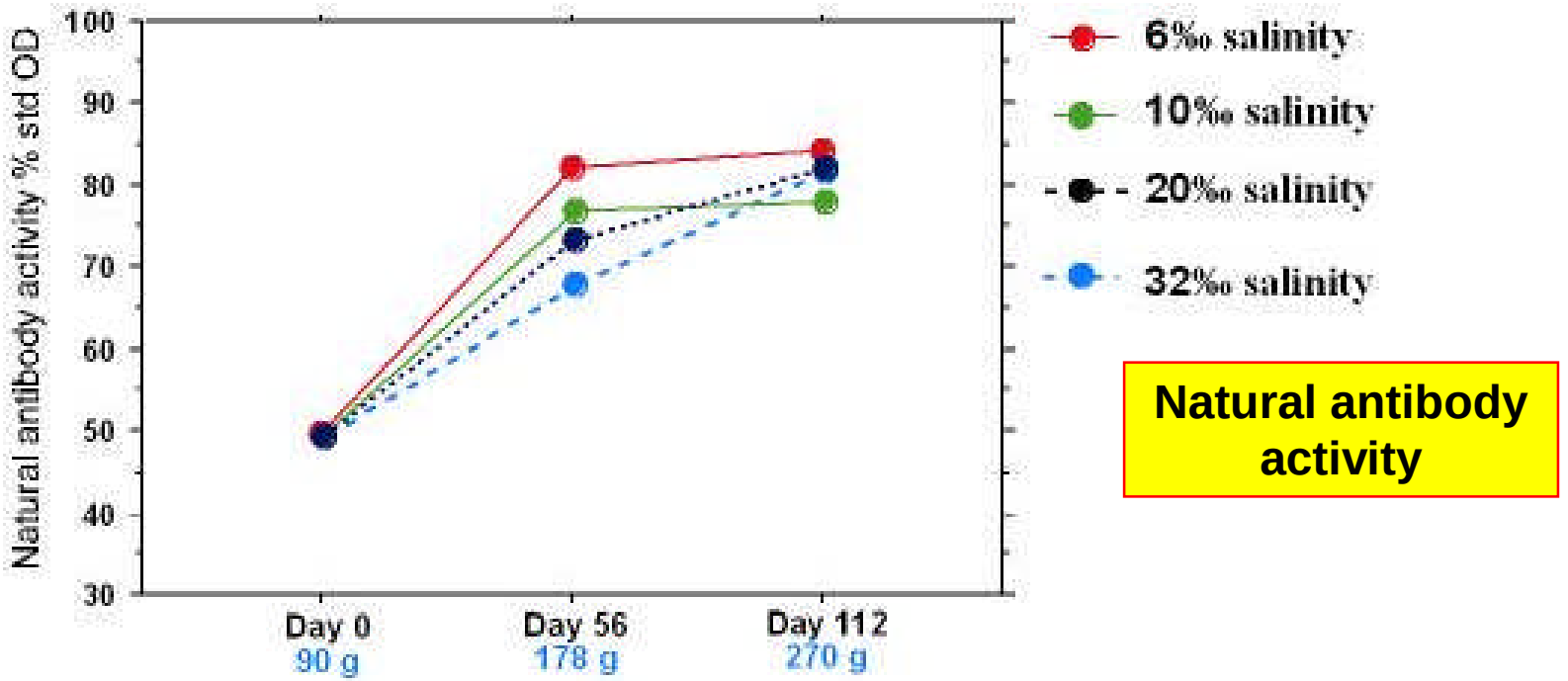




**Total plasma protein mg/ml**

- **Plasma protein concentration increased with increasing size**
- **Variable salinity had no effects**

# Experiment 1: Large fish

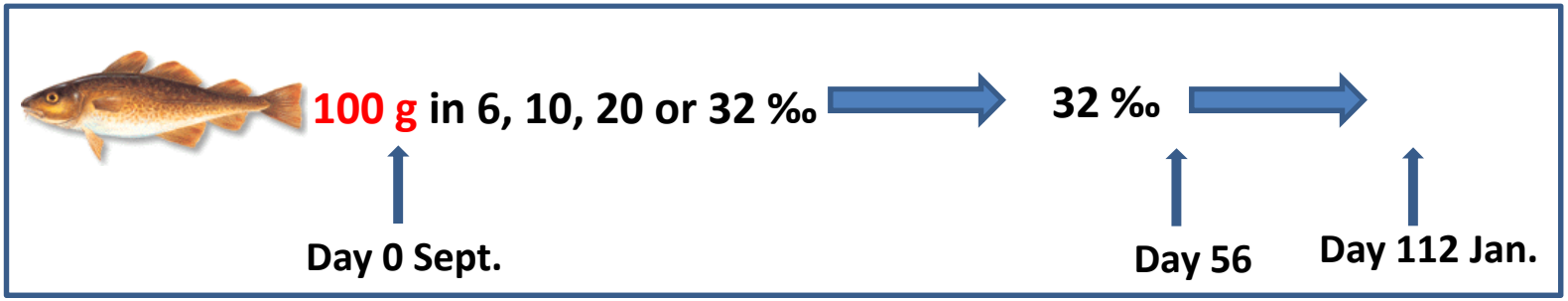


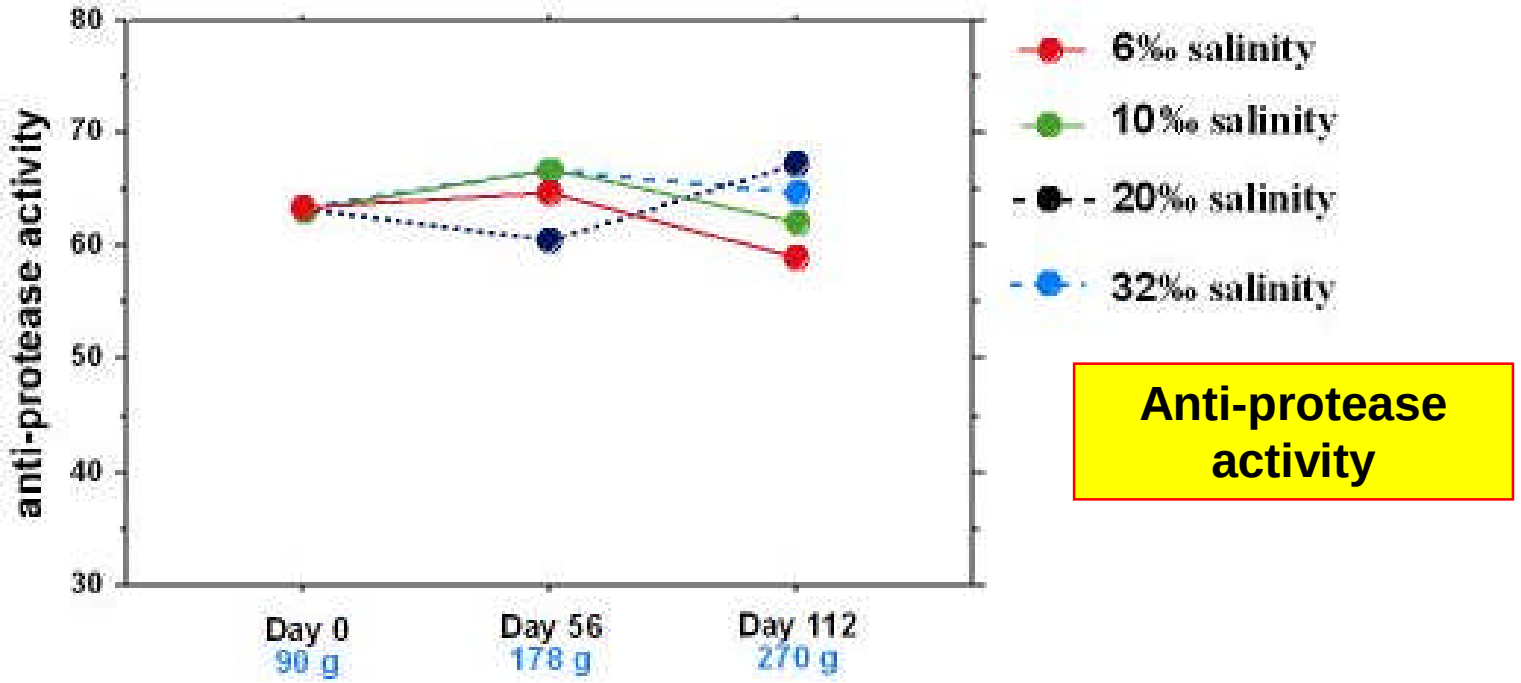




**Natural antibody activity**

- **Natural antibody activity increased with increasing size**
- **Variable salinity had limited effects**

# Experiment 1: Large fish



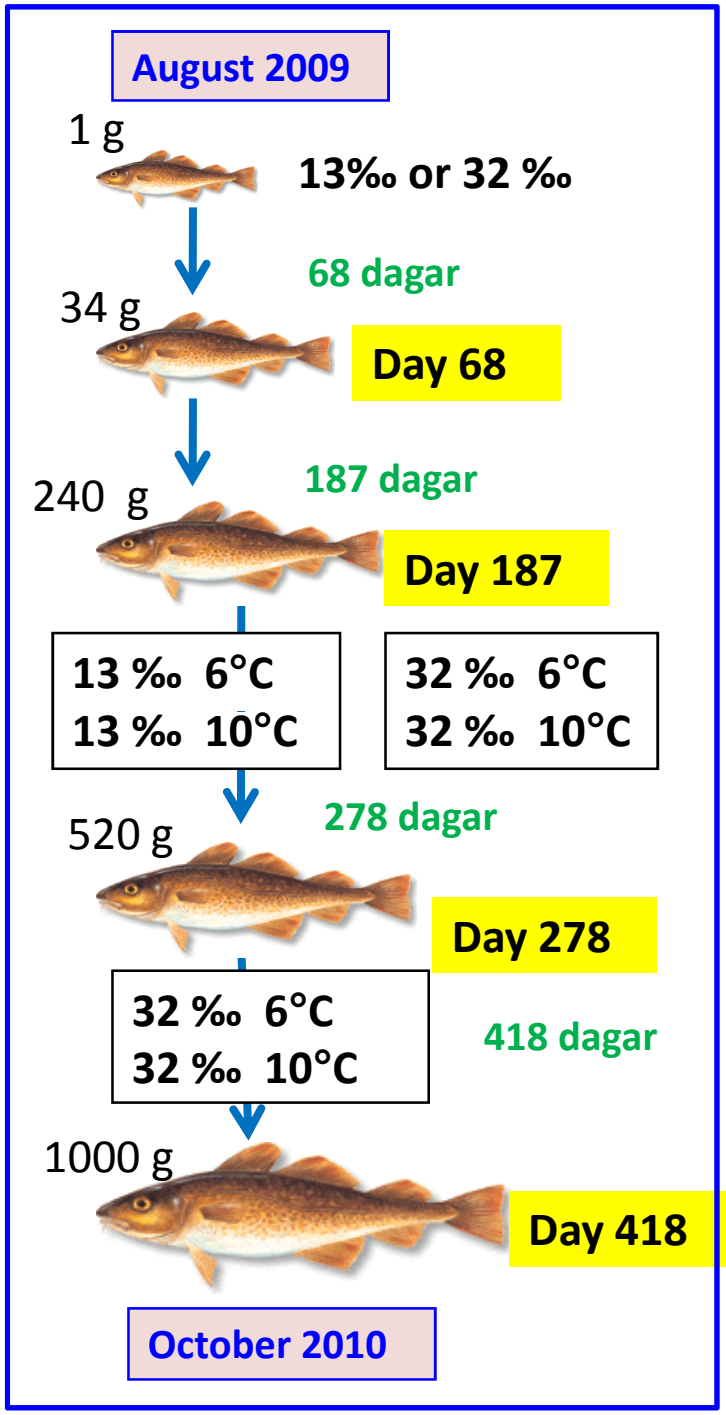

**Anti-protease activity**

- **Anti-protease activity was not affected by either size or salinity**

# Experiment 2:

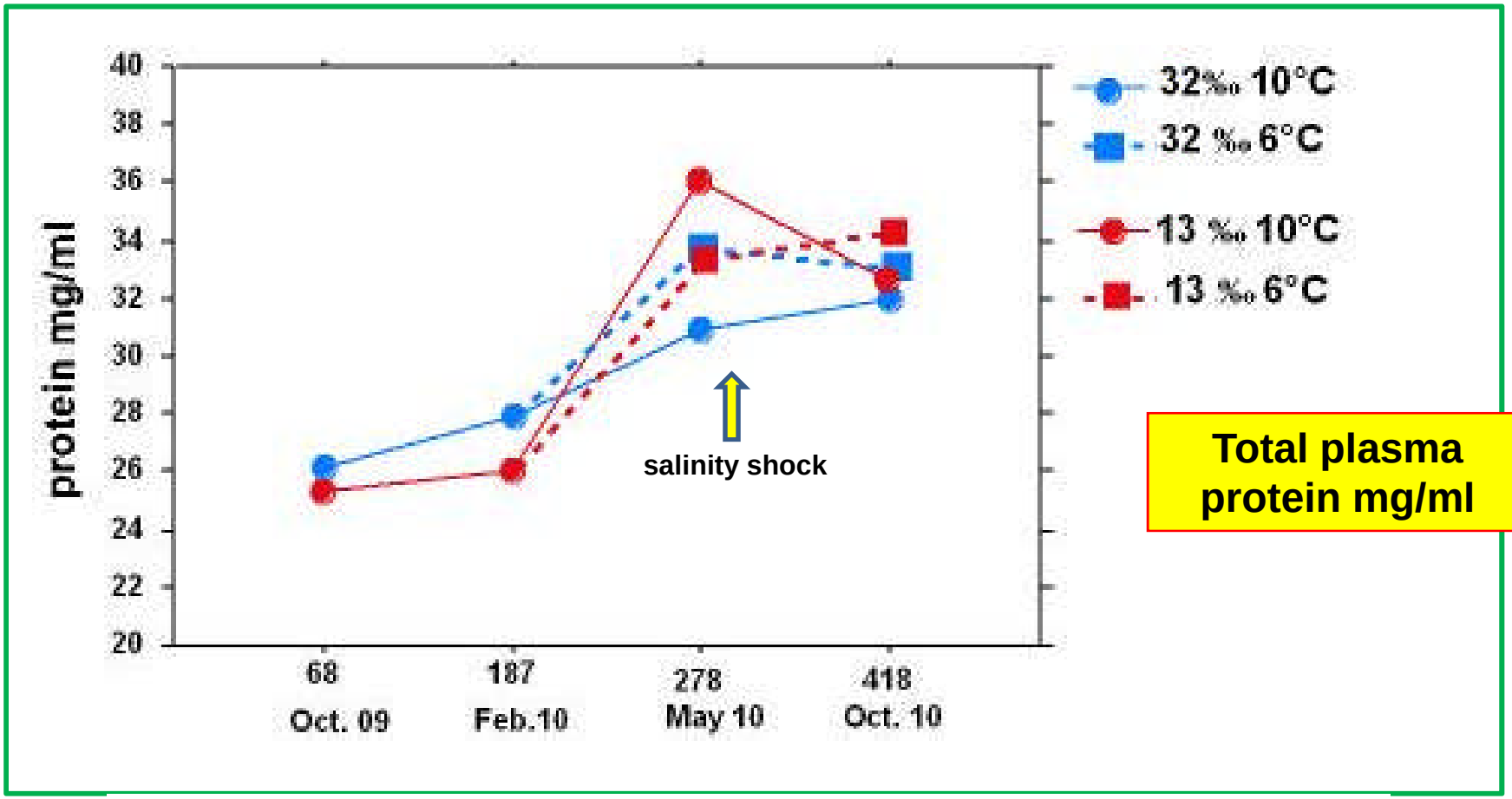
## 2 salinities, 2 temperatures and salinity shock

**Blood samples were collected over a period of 12 months**



# Experiment 2:

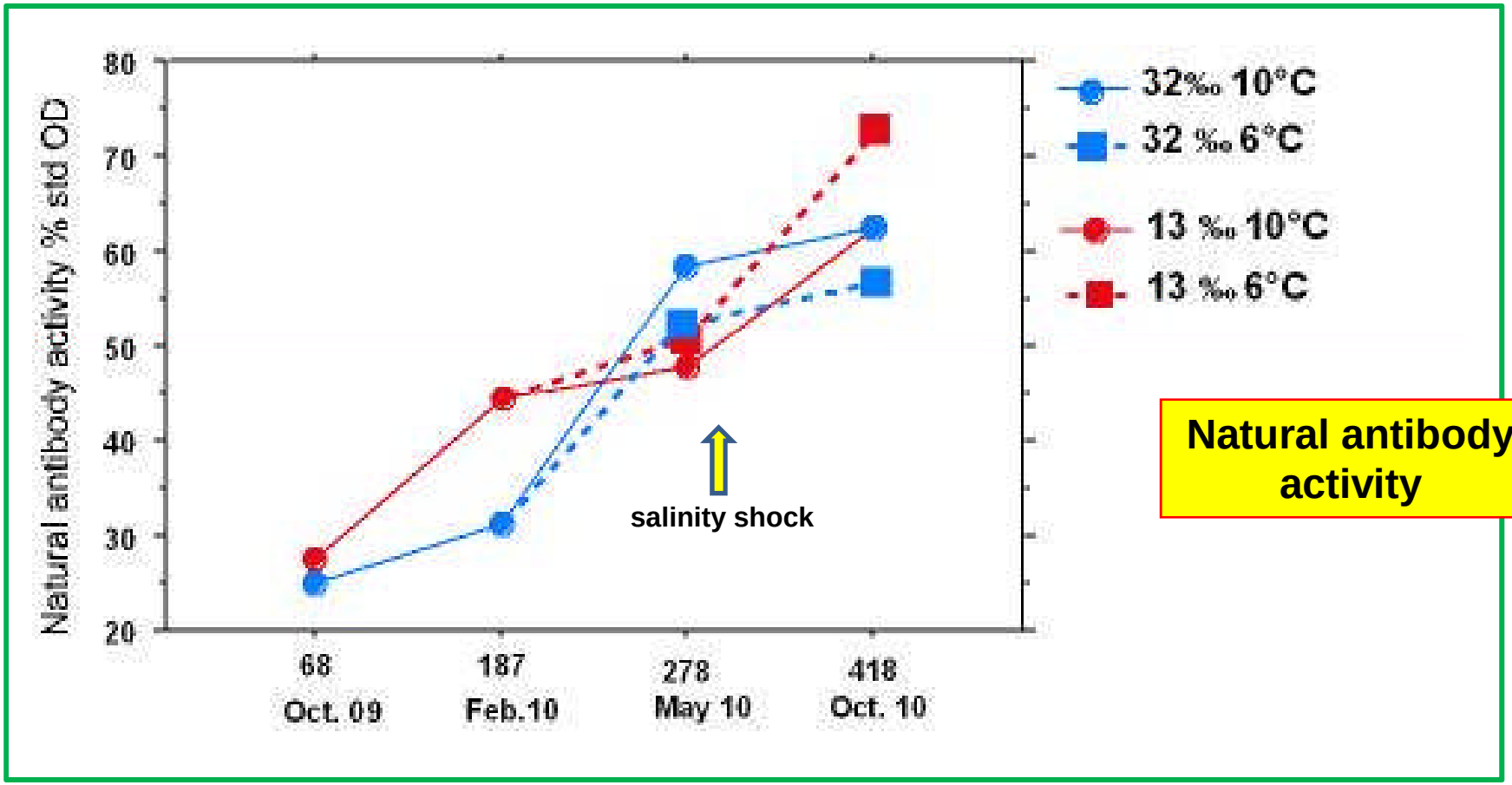
## 2 salinities, 2 temperatures and salinity shock




- Plasma protein concentration increased with increasing size
- Different salinity, temperature and sal. shock had little effects

# Experiment 2:

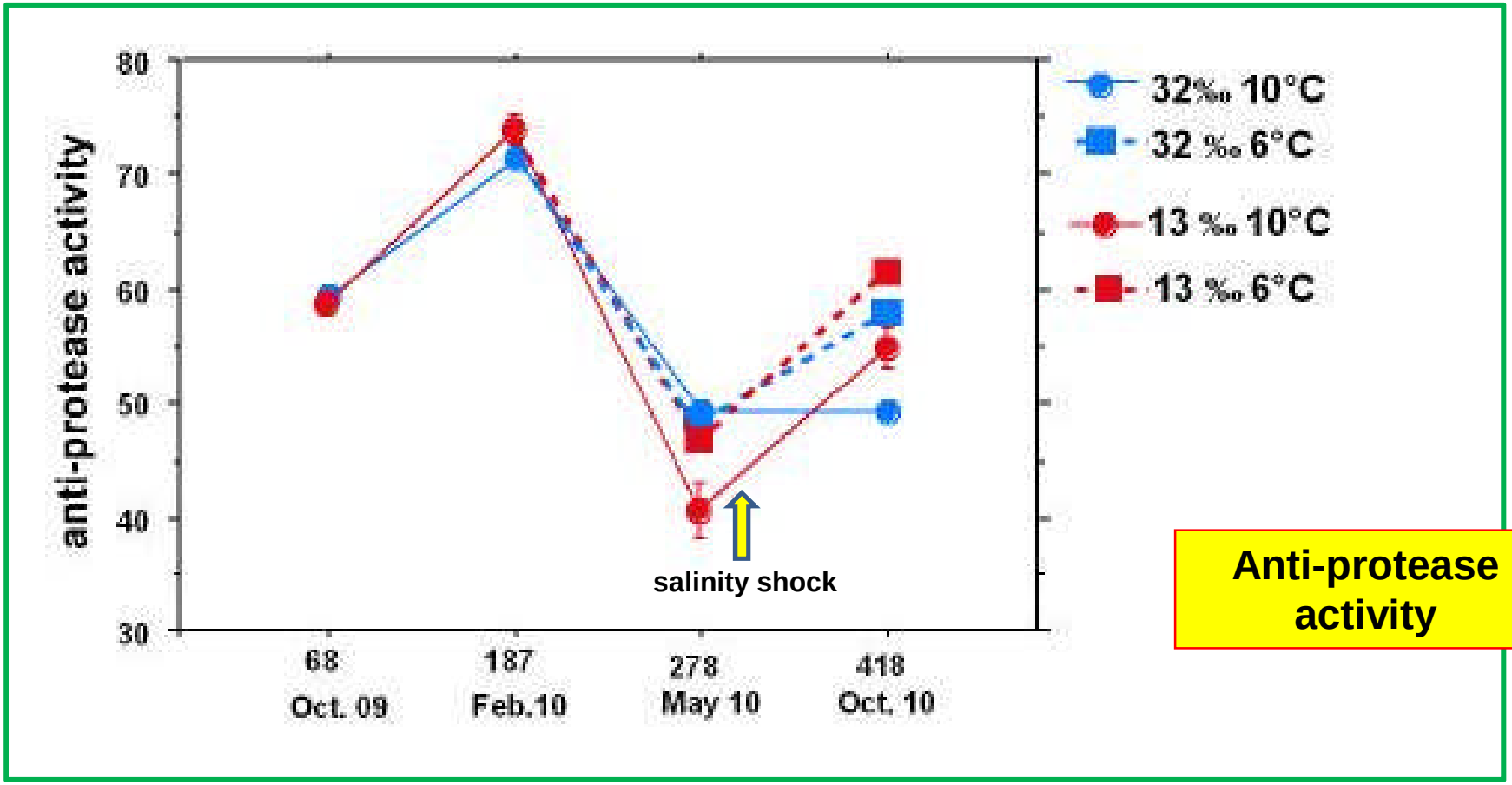
## 2 salinities, 2 temperatures and salinity shock




- Natural antibody activity increased with increasing size
- Different salinity, temperature and sal. shock had limited effects

# Experiment 2:

## 2 salinities, 2 temperatures and salinity shock




**Anti-protease activity**

- **Different salinity, temperature and sal. shock had no effects**
- **A possible seasonal change (reduction) was seen in May**

# Summary

- **Total plasma protein concentration**
  - Increased with increasing size while variable salinity from 6 – 32‰, temperture difference of 6 – 10°C and salinity shock had little or no effects
- **Natural antibody activity**
  - Increased with increasing size, was not affected by variable salinty, was slightly affected by temperture difference of 6 – 10°C and salinity shock may have had some effects
- **Anti-protease activity**
  - Was not affected by increasing size, variable salintiy or temperature but showed seasonal change

**The project was supported by AVS R&D Fund of Minitstry of Fisheries in Iceland**

**Assistant at Keldur:**

**Sigríður Steinunn Auðunsdóttir,**

**B.Sc. Biologist & M.Sc. student**

# *Thank you!*