

# **Erythromycin to Control Bacterial Kidney Disease: Overview of Project, and Progress Report**

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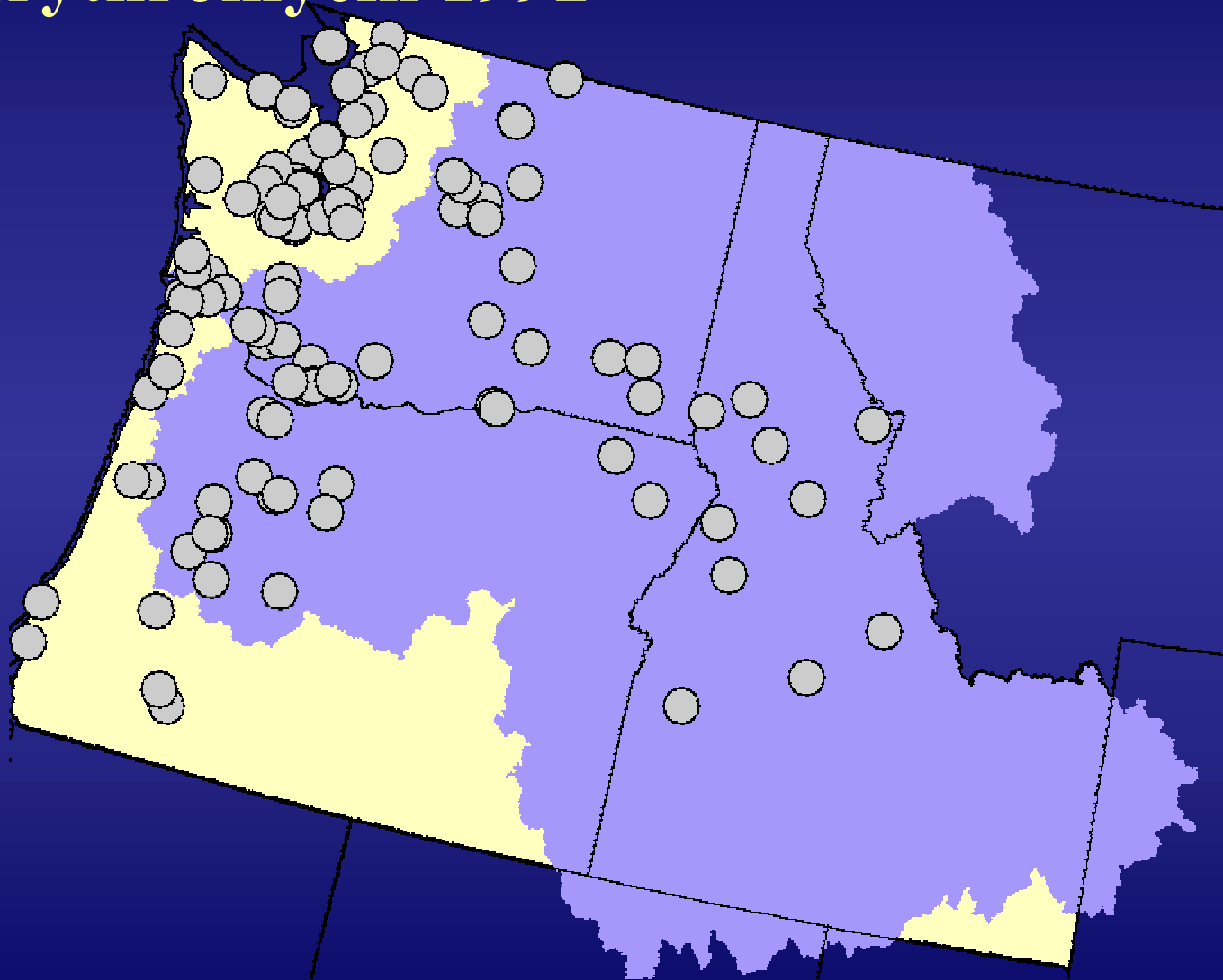


# Completed Approval

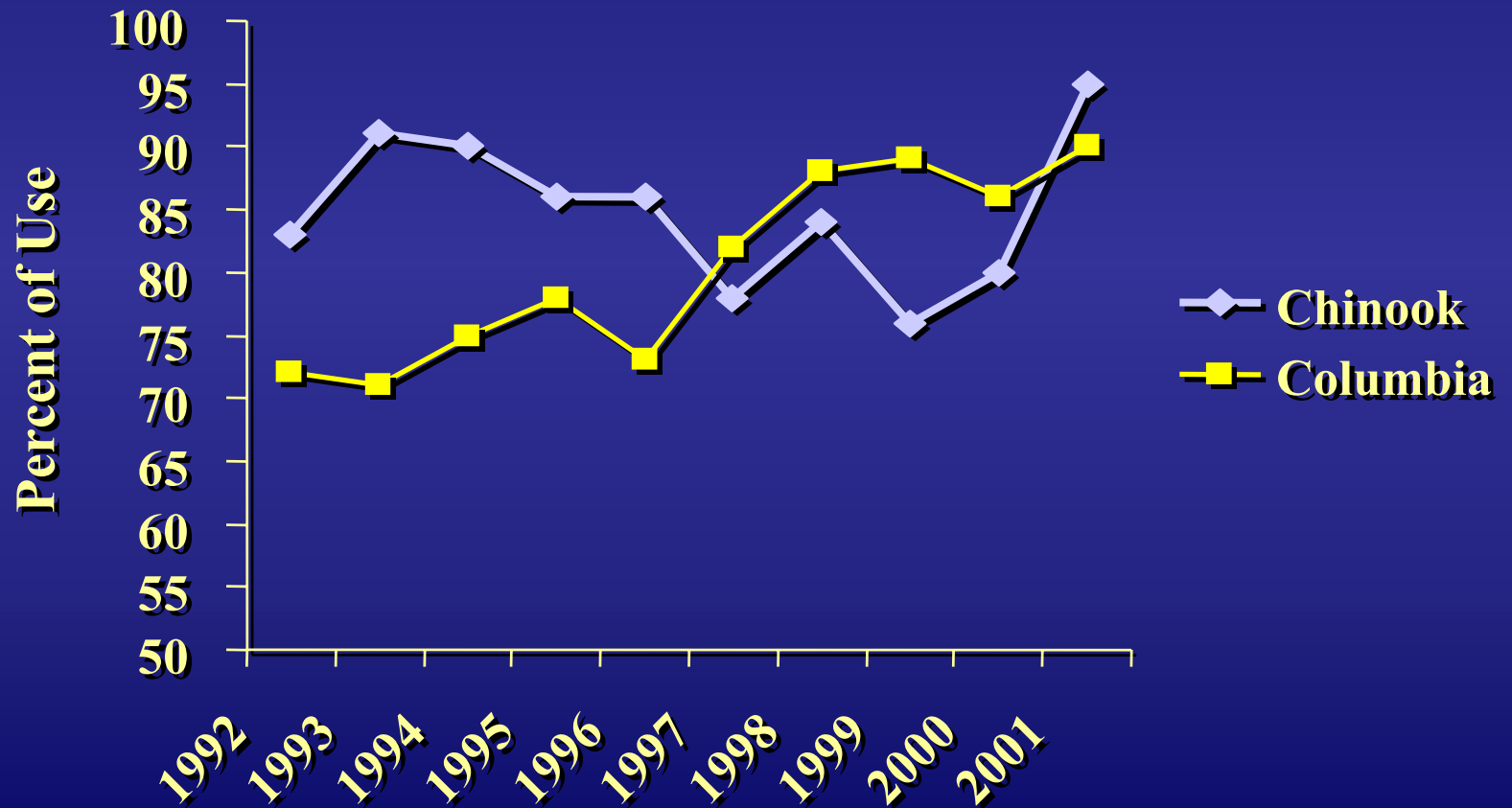
- **TAS**
- **Clinical Efficacy Trials**
- **Residues Depletion**

**Funding provided by Bonneville Power  
Administration, USFWS, and NRSP-7 program  
& in kind support from WDFW, ODFW, IDFG**

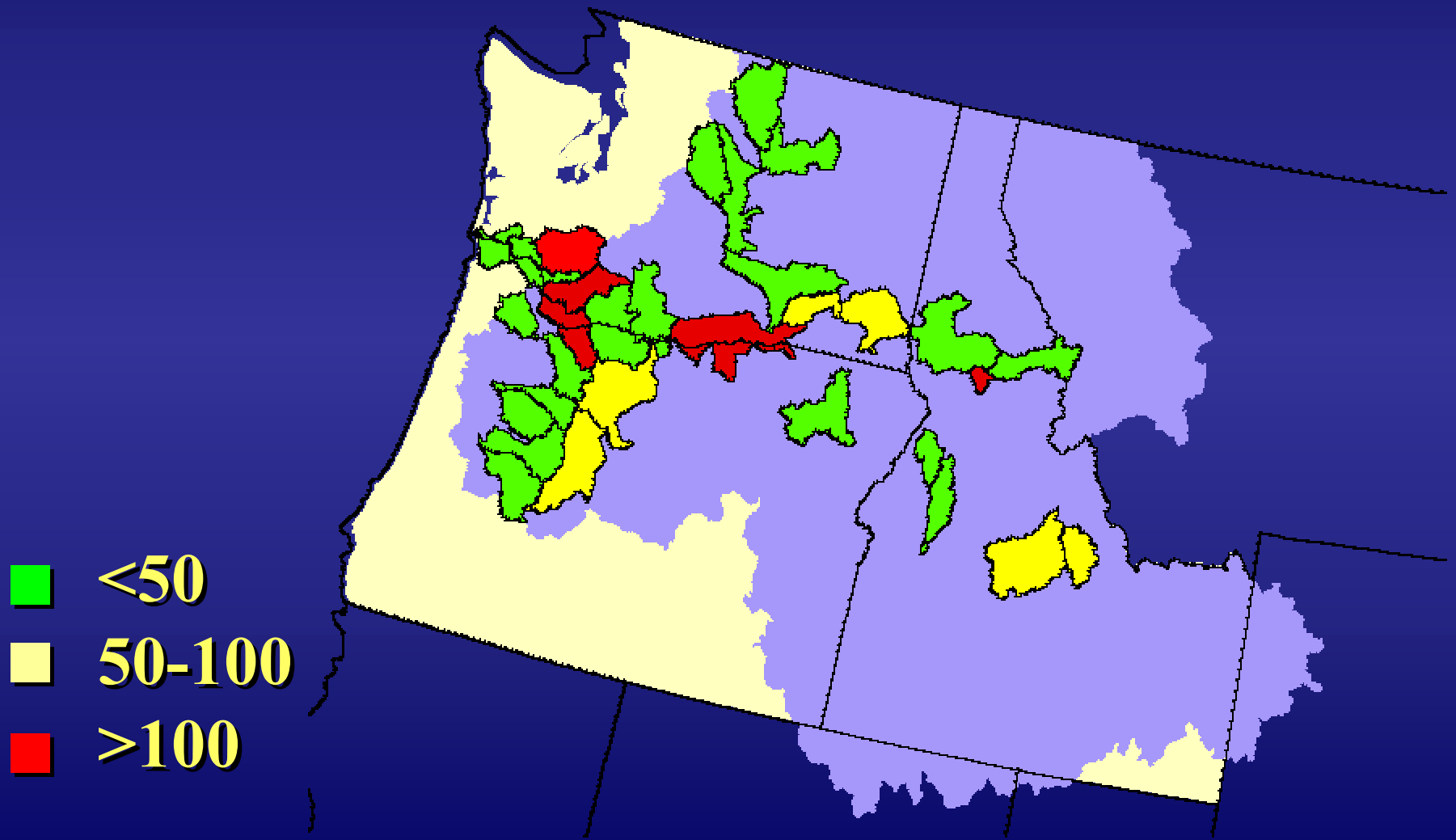
# Hatcheries or Release Sites that Used Erythromycin 1992 +



# Percent of Total Use Over Time



# Mg/yearling released



# Percent of Hatcheries Using Erythromycin

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Interval Number		1-2 yrs	3-5 yrs
1992-1996		64.5	35.5
1997-2001		65.2	34.8

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# **Outstanding in Approval**

- **Bridging Techniques for Detection**
  - **Currently in progress**
- **Environmental Assessment**
  - **Combination of new data and existing data from collaborations**
- **Human Safety – Antimicrobial Resistance**

# **ISSUES UNRESOLVED**

- **Concerns Originating in the Centers for Disease Control Regarding Risks of Resistant Microorganisms Associated with Antibiotic Therapy in Animals**
- **Little Understanding of Aquaculture and Associated Risks**



# **FDA Specific Questions to be Addressed**

- **Will Bacterial Resistance During Treatment Extend into Post Treatment Phase?**
- **Will Resistance Persist in Fish until Release?**
- **Will Resistance Persist in Fish that Do not Migrate to the Ocean?**

# **Approaches to Environmental Epidemiology**

- **Document Nature and Extent of Exposure**
- **Definition of Exposed and Unexposed Populations**
- **Diagnosis and Measurement of Effects**
- **Relation between Exposure and Effects**

# Objective

**Conduct experiments to understand the extent of erythromycin resistant microflora in the GI tract of fish before, during, and following treatment with erythromycin**



# **Risk Assessment Document**

- **Guidance Document 152**
- **Analysis of the state of knowledge, with description of methods and results to address bacterial flora in the target animals**

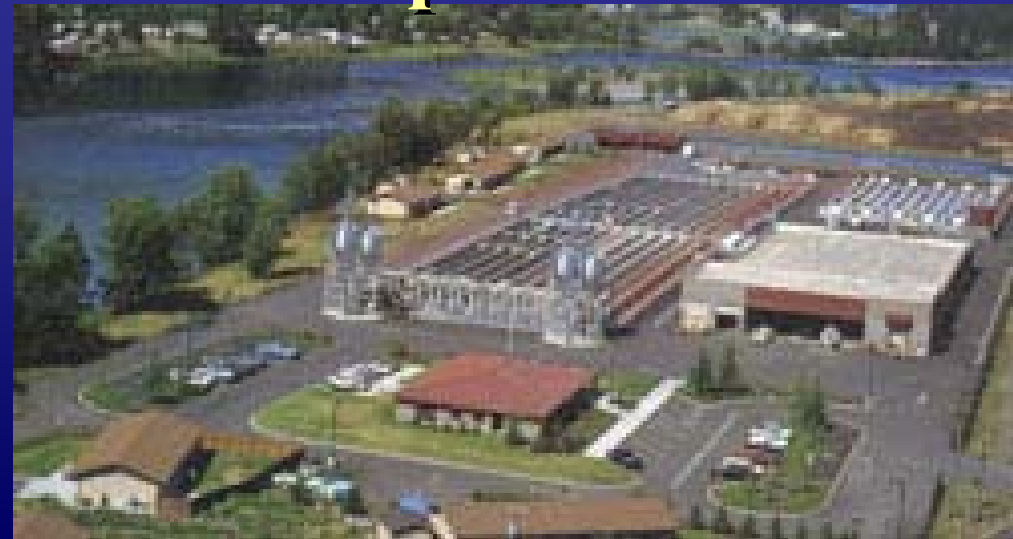
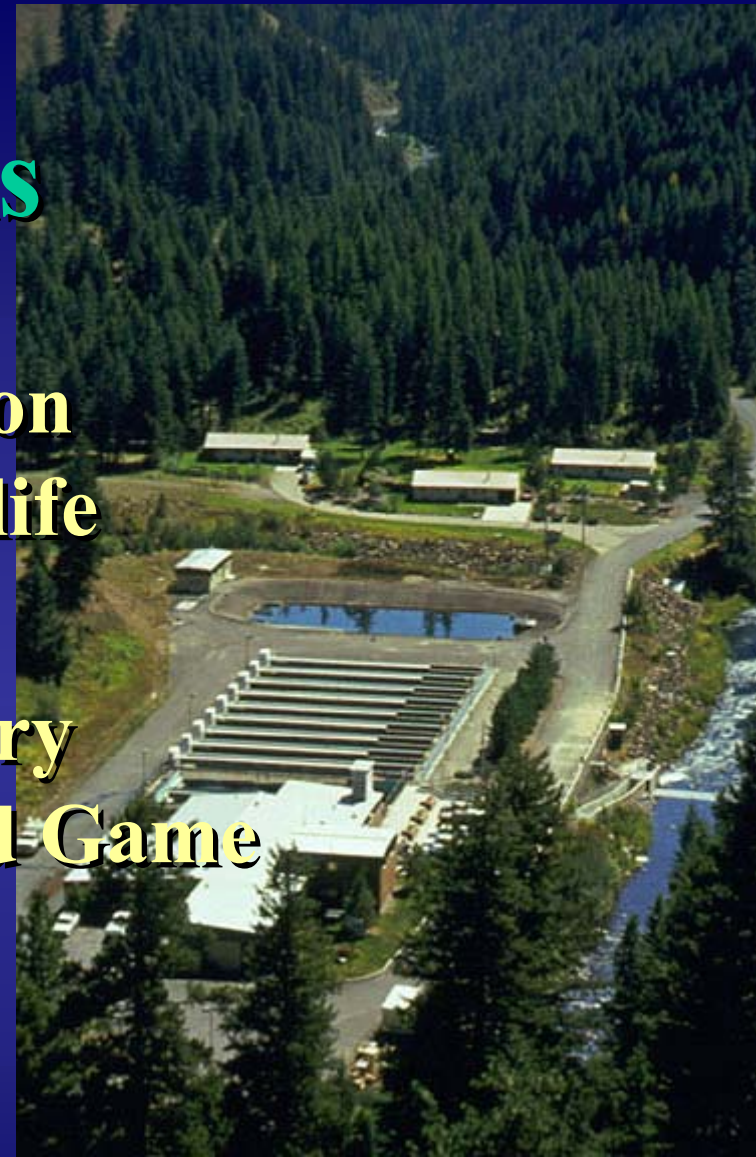
**What are the numbers and what kinds of bacteria live in the GI tract of salmonids?**

**What changes occur in numbers and diversity during and after erythromycin therapy?**



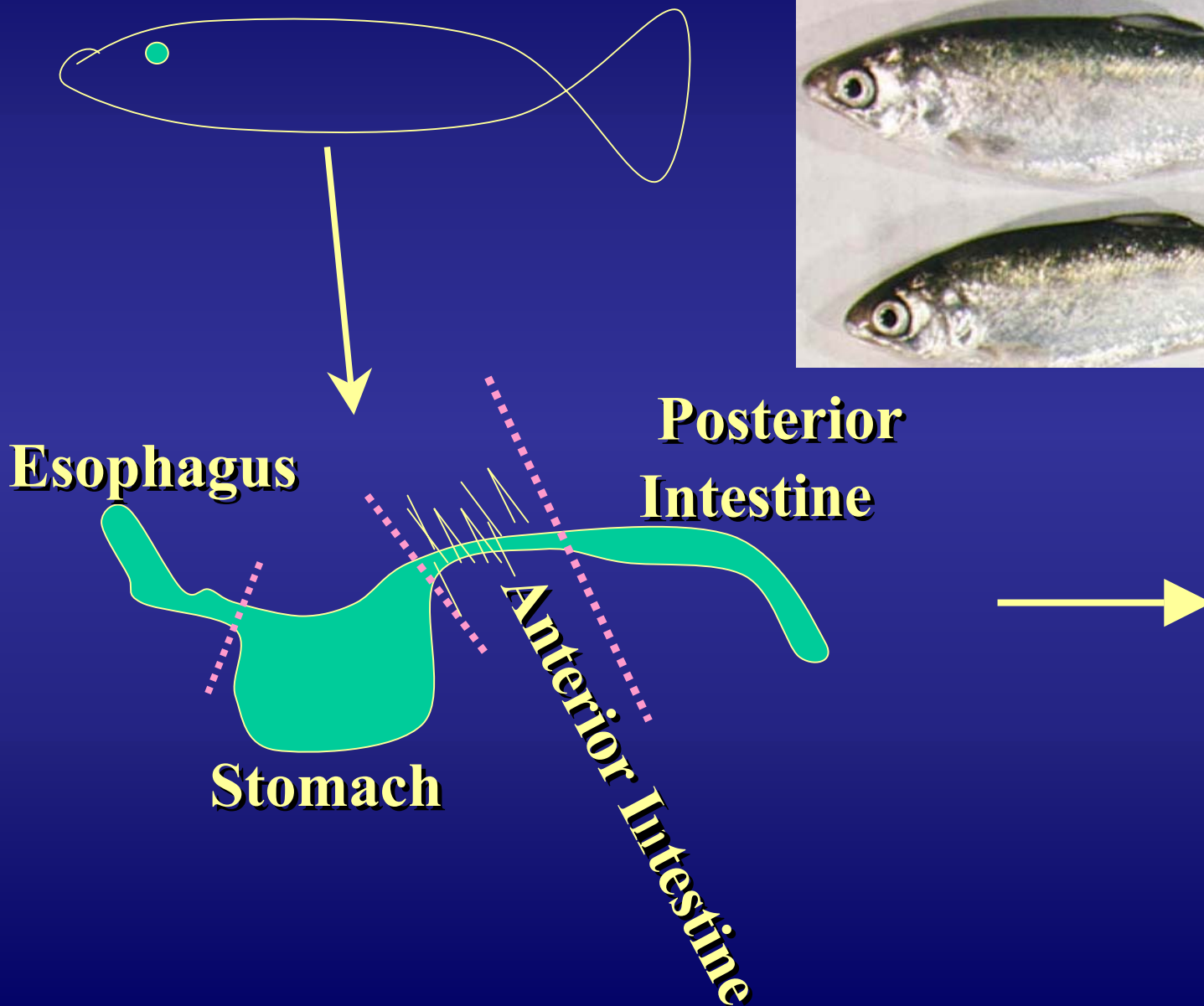
# Field Trials

- **Lookingglass Hatchery, Oregon**  
**Department of Fish and Wildlife**
- **Clearwater State Fish Hatchery**  
**Idaho Department of Fish and Game**

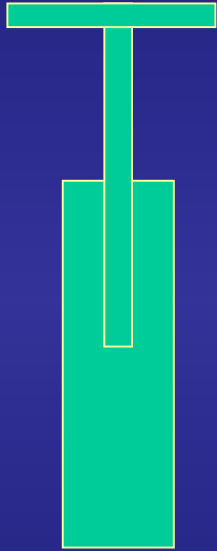




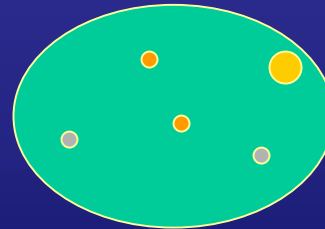
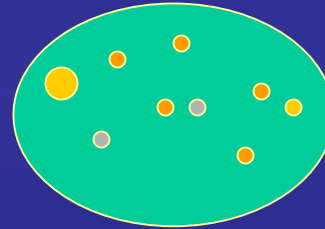
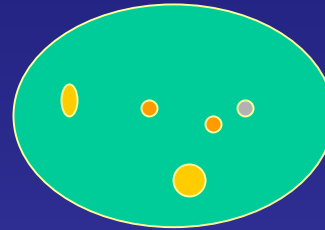
# Sections of Salmonid GI Tract



**Incubate 8 d @ 15°C**

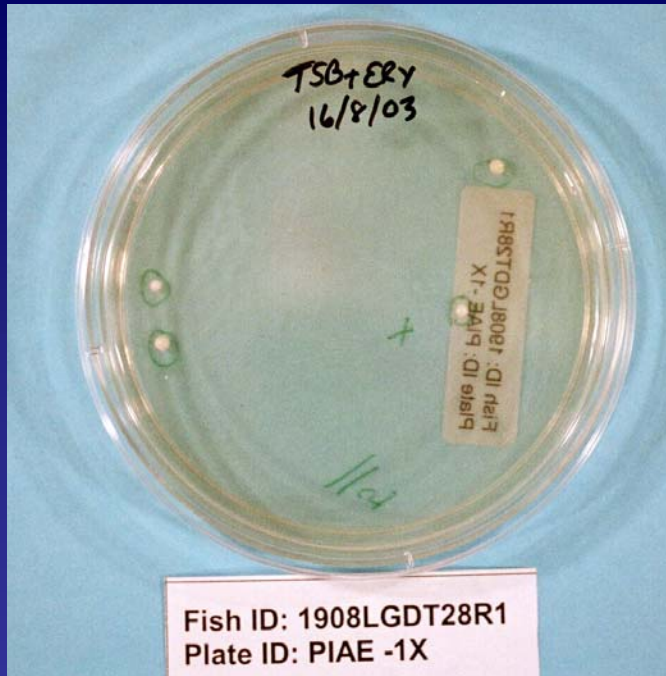
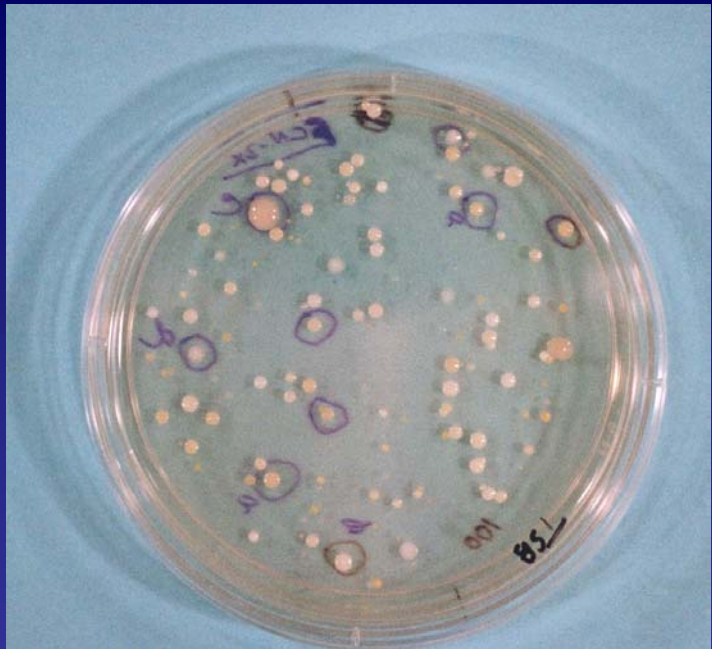


**Grind Tissue, Dilute  
and Plate**



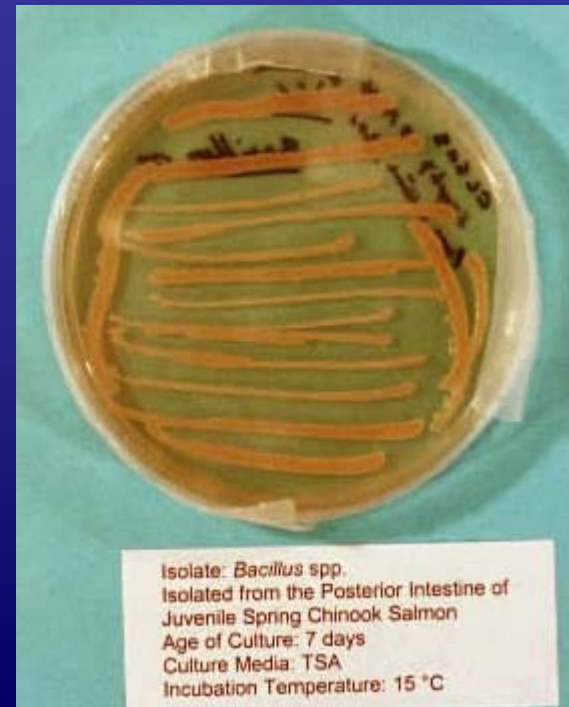
**TSA Agar  
w & w/o Ery**



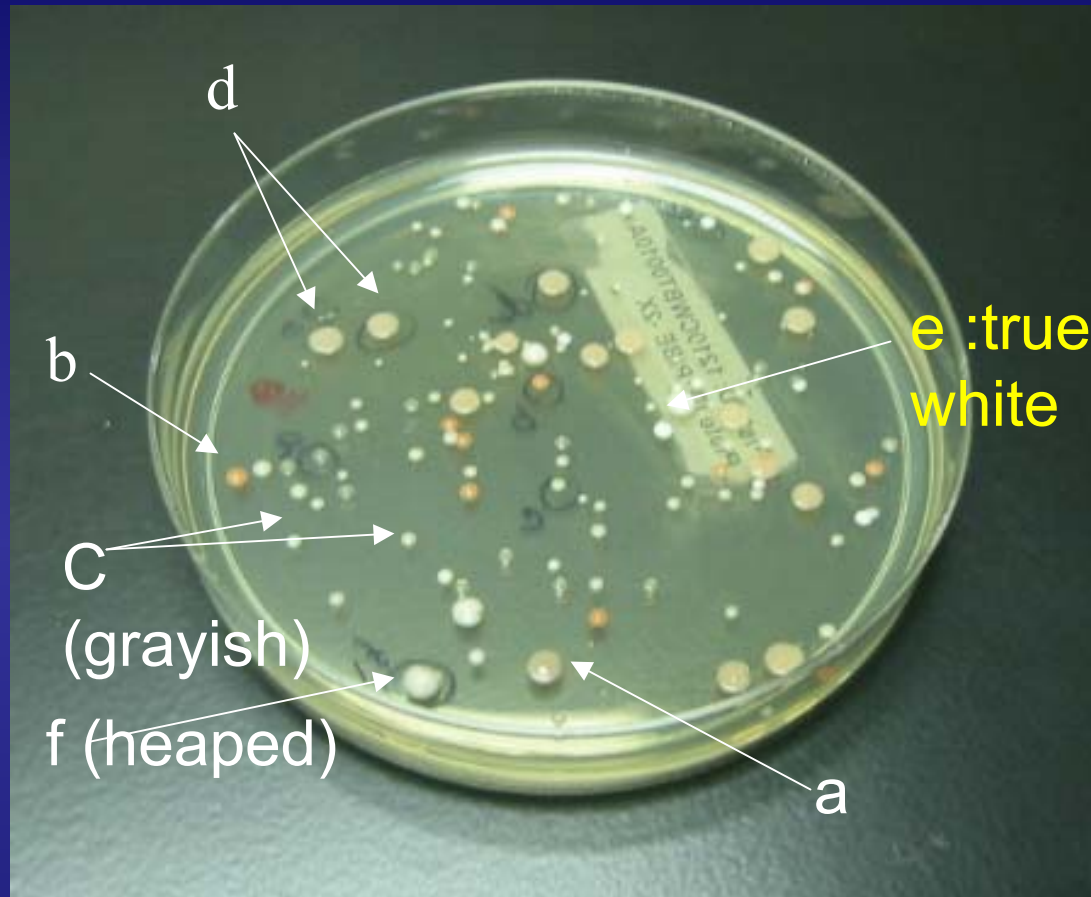


**Count Colonies  
per g tissue**

**Select Colonies at Random**



## Isolate, Profile with Phenotypic Characteristics

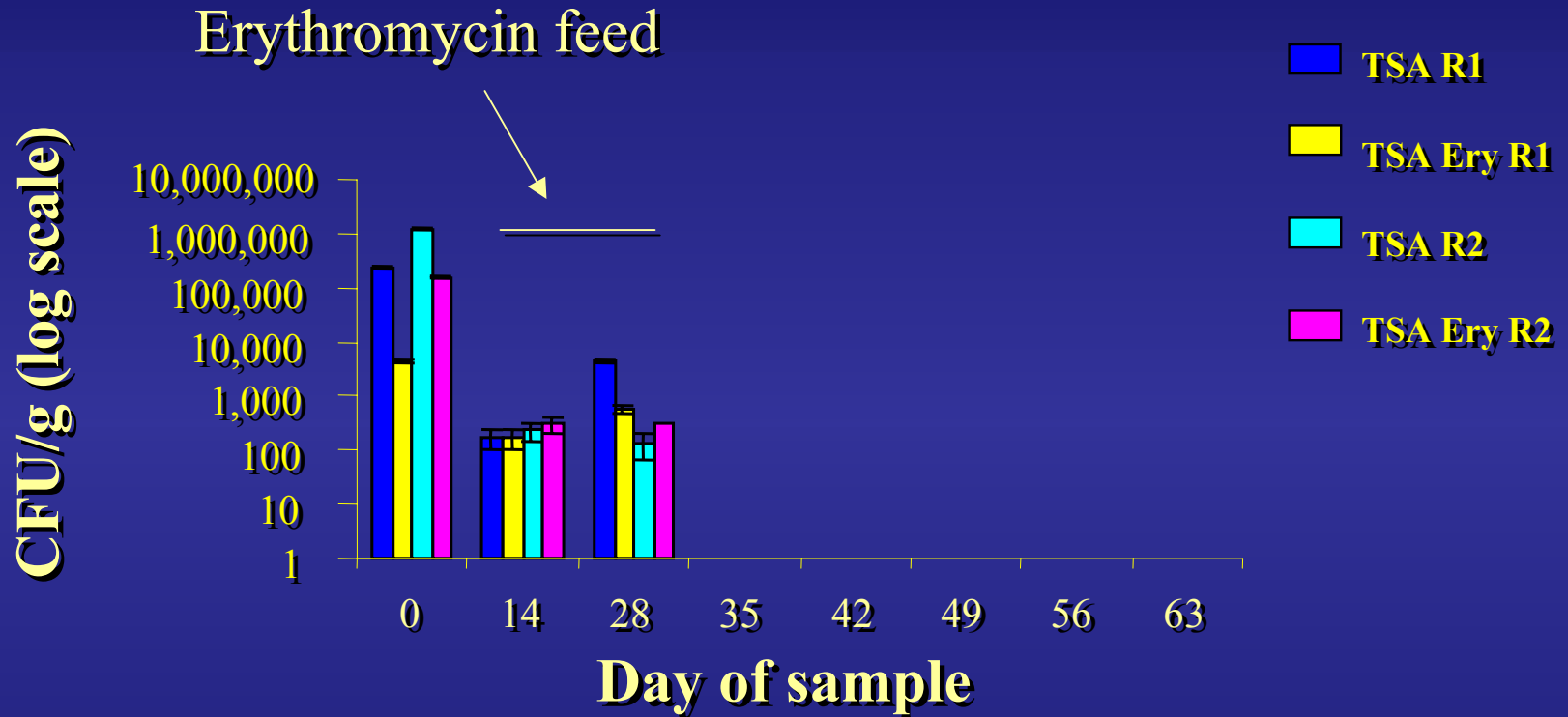


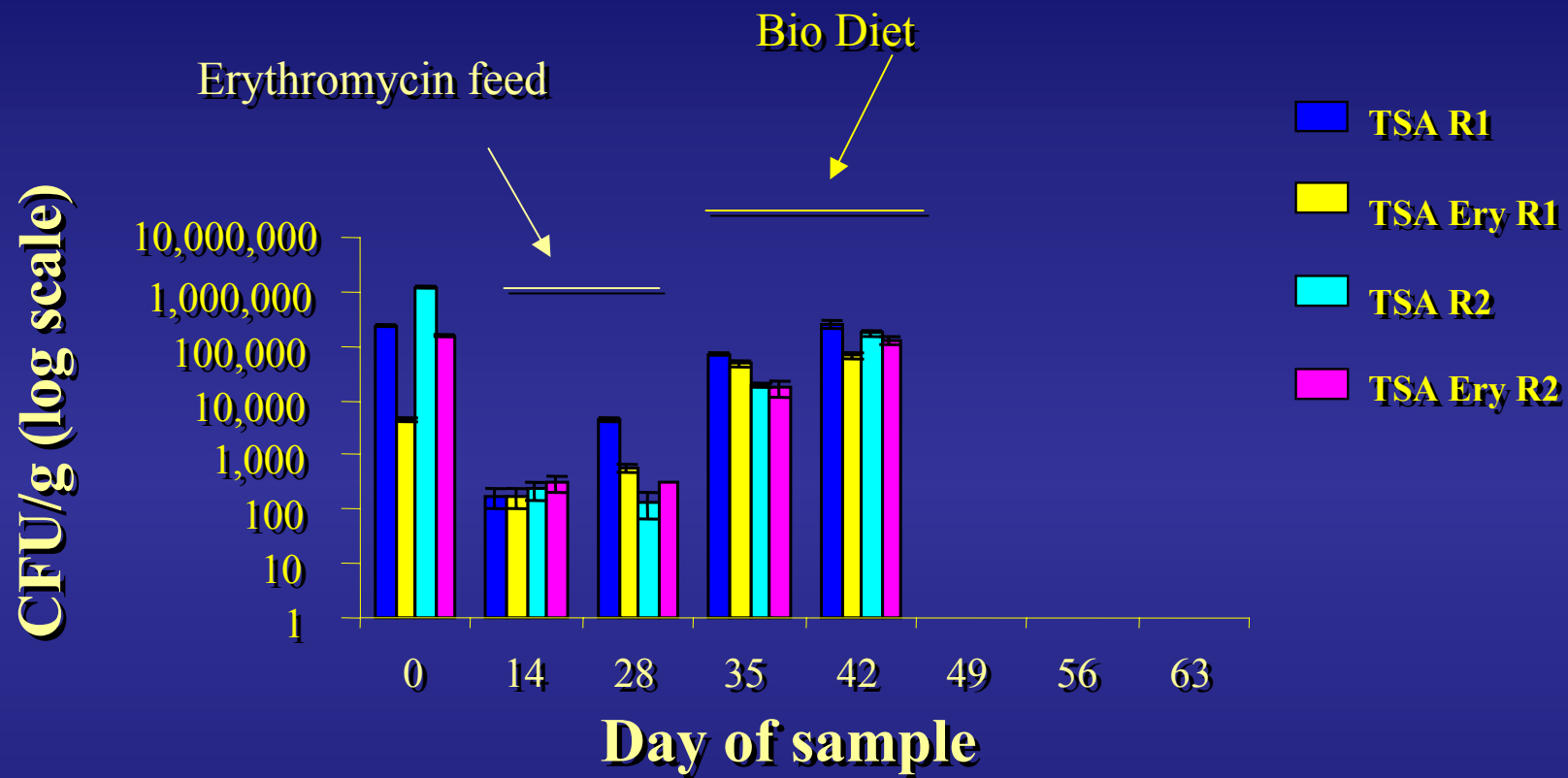
**Clear Water Hatchery, 1210CWB T00, Unidentified bacteria cultured from the intestine of juvenile Spring Chinook Salmon. Culture medium: TSA. Incubation temperature: 15°C. Age of culture: 7 days**

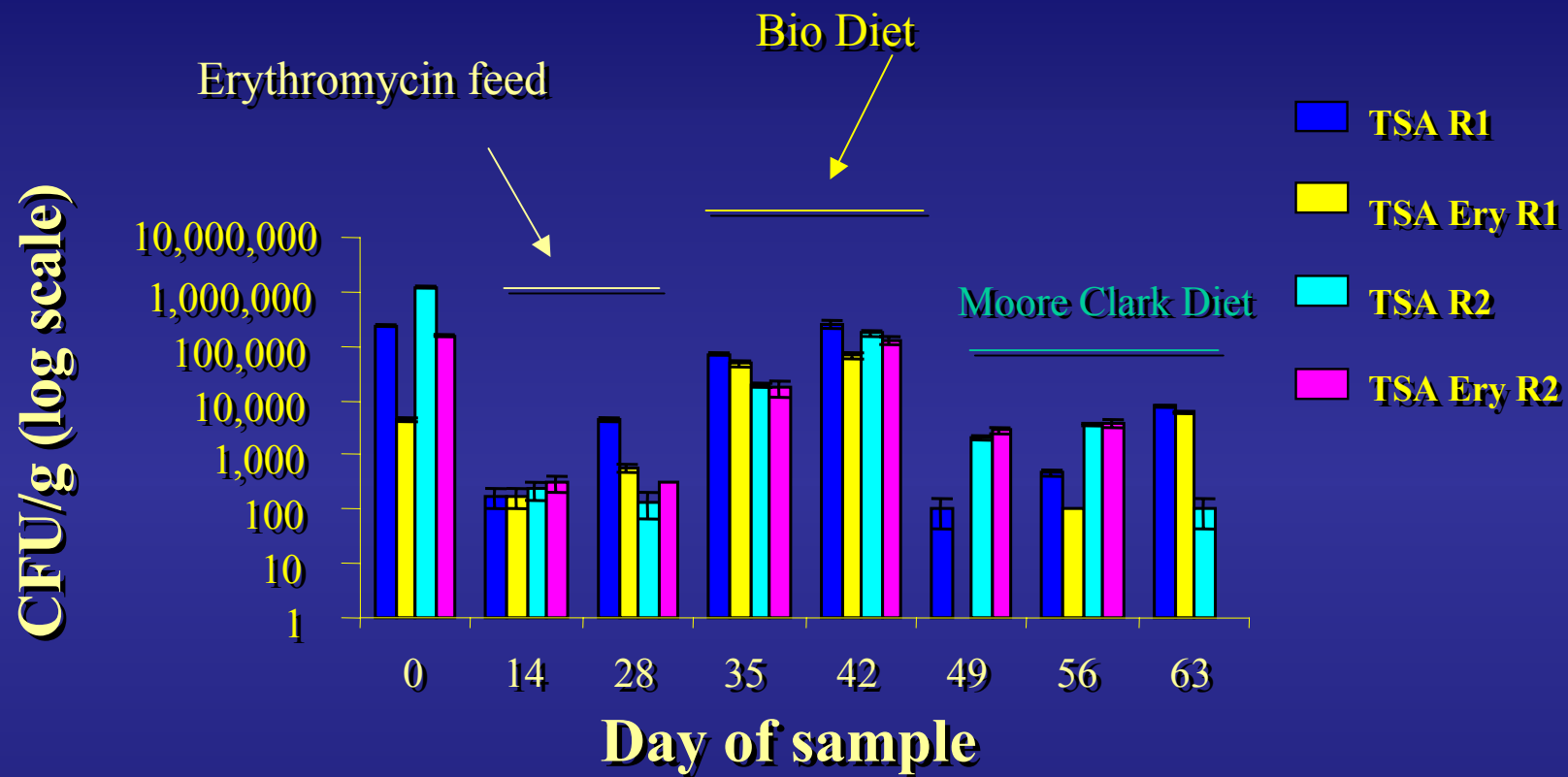
# Isolate Pure Culture and Select Profiles for Bio Chemical API characterization



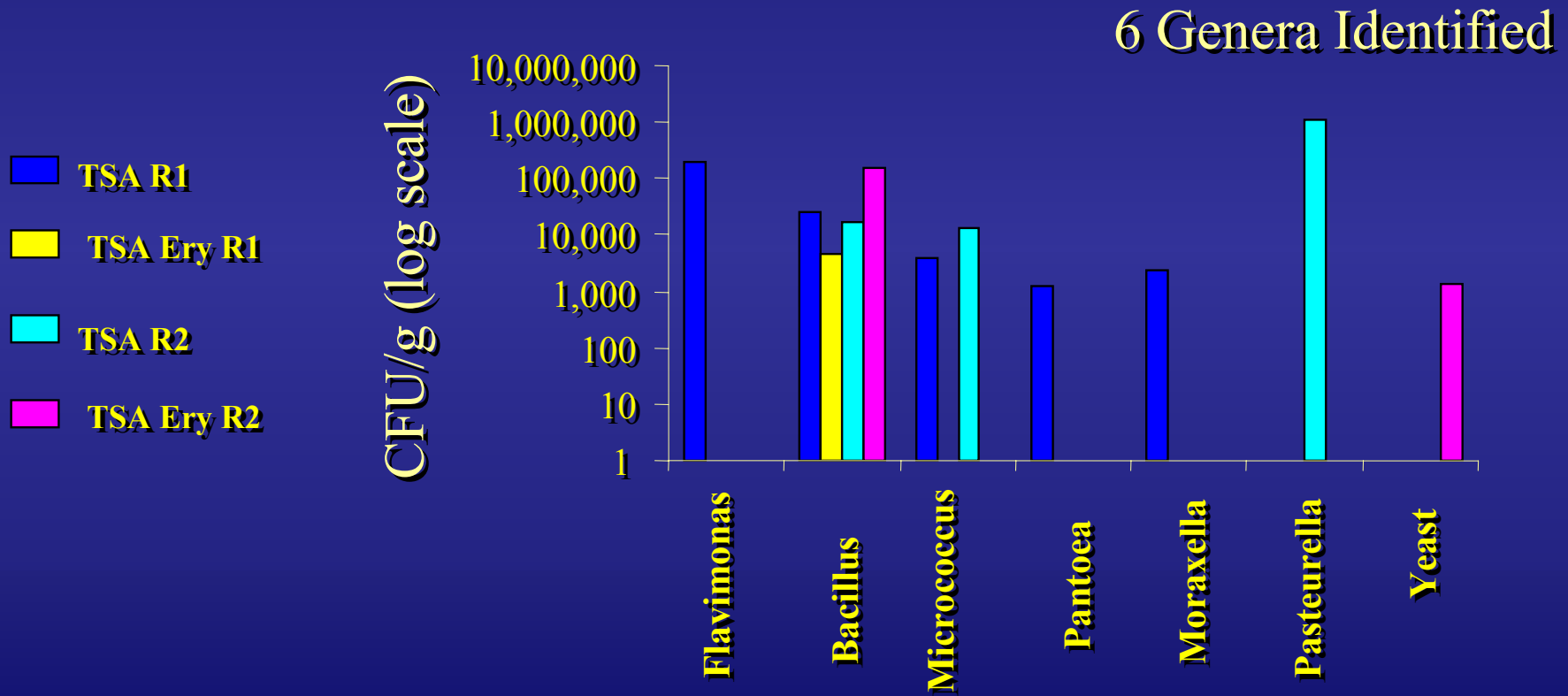
# Lookingglass Hatchery Results



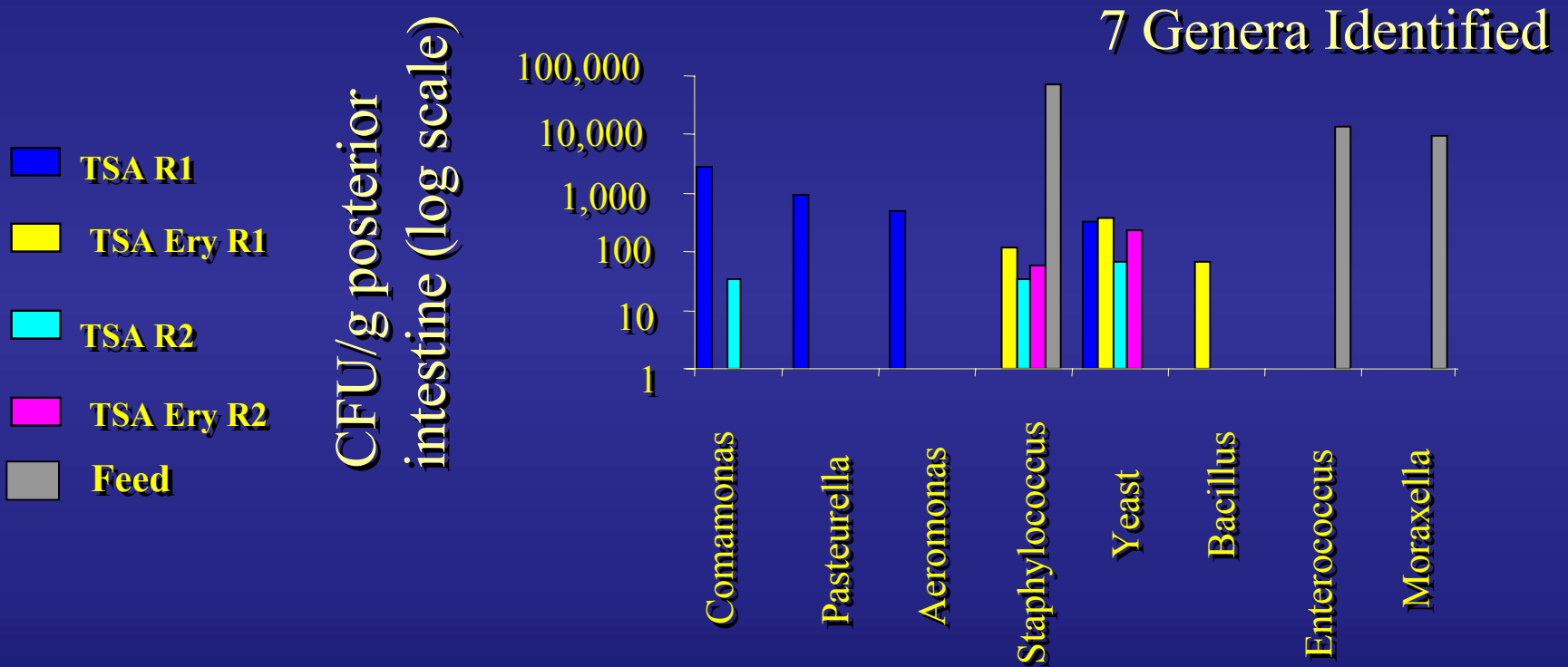




# Genera Before Treatment, Lookingglass



# 28<sup>th</sup> day, End of Ery Feeding





# Genera Observed at Lookingglass

Genera	Day-0	Day-28	Ery Feed
<i>Flavimonas</i>	X		
<i>Micrococcus</i>	X		
<i>Pantoea</i>	X		
<i>Moraxella</i>	X		X
<i>Bacillus</i>	X	X	
<i>Pasteurella</i>	X	X	
<i>Comamonas</i>		X	
<i>Aeromonas</i>		X	
<i>Staphylococcus</i>		X	X
<i>Enterococcus</i>			X

# Summary to Date

- **Genera of Microorganisms are Transient and Reflect Food and Environment**
- **Erythromycin Feed Reduces Total Number Microorganisms**
- **Resistant Microorganisms Occur at all Times**