



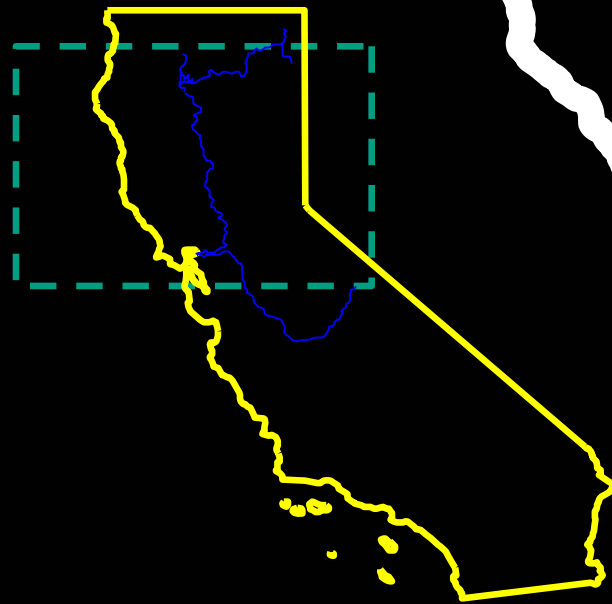
YFD in Late Fall Chinook Salmon at Coleman National Fish Hatchery By Ken Nichols & Brett Galyean



Acknowledgements

- Coleman NFH staff
- Ca-Nv FHC
- Abernathy FTC

**PACIFIC
OCEAN**



Shasta
&
Keswick
Dams

**Sacramento
River**

Battle Creek

**Coleman
NFH**

Purpose: Constructed in 1942 to partially mitigate for the impacts of Shasta Dam (~187 miles of lost habitat).



Coleman NFH Propagation Programs:

Run/Species	Target Release #/Life Stage	Release Time/ Location
Fall Chinook	12,000,000 smolt	Mar-Apr/ BC + San Pablo Bay
Late-fall Chinook	1,000,000 smolt	Nov-Jan/BC
Steelhead	600,000 smolt	Jan/ Sac River



Late Fall Chinook

- Integrated-harvest
- Need 300 spawning pairs
- 100% Clipped & CWT
- Released (13 FPP) in Nov – Jan.





Normal Rearing Cycle

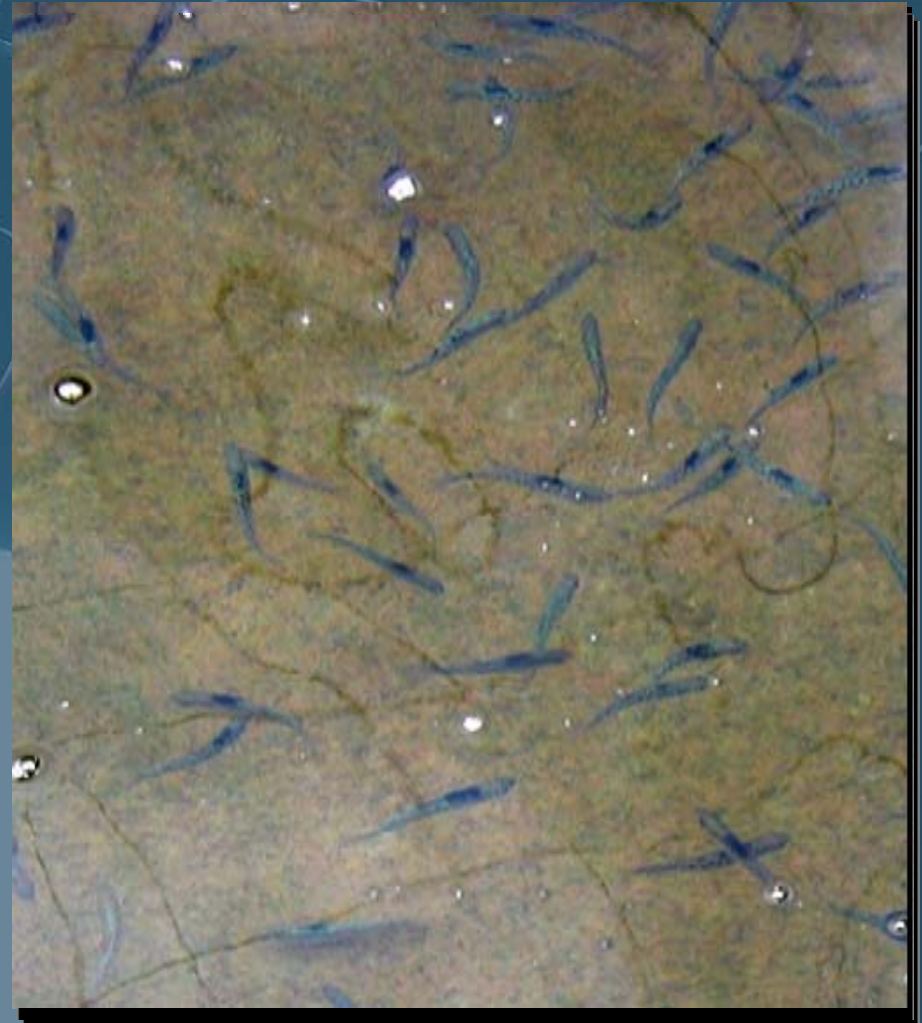


- Spawning (late Dec – Feb).
- Ponded into 8 x 80s (Apr – May).
- @ 200/lb moved to 15 x 150s (May-Jun).
- This year...



BY 2009 LFS

- Noticed during EOM sampling (May 26th)
- Feed sizes had recently been switched
- June 15th in all rways
- End of June was decreasing, however mortality was above 1% in all rways





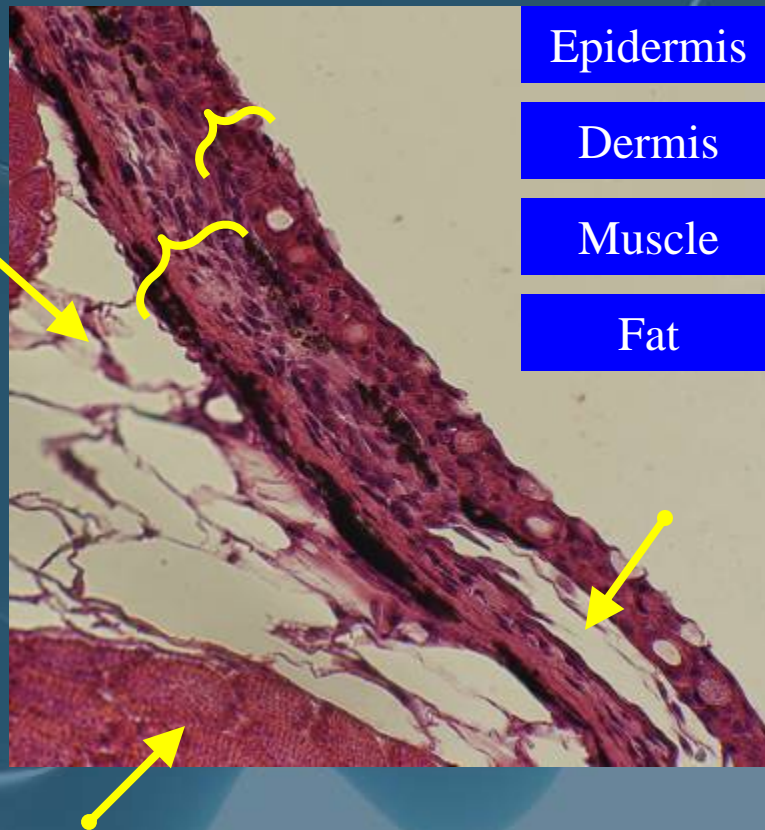
Sunburn?



- Initial exam - May 26
- Not infectious (no obligate pathogens or parasites)
- Opportunistic bacterial infections in fish w/ open lesions
- Occasional healing fish observed even 4 month later
- Low mortality
- Dorsal fin to head
- Did not include head

Skin

- Normal

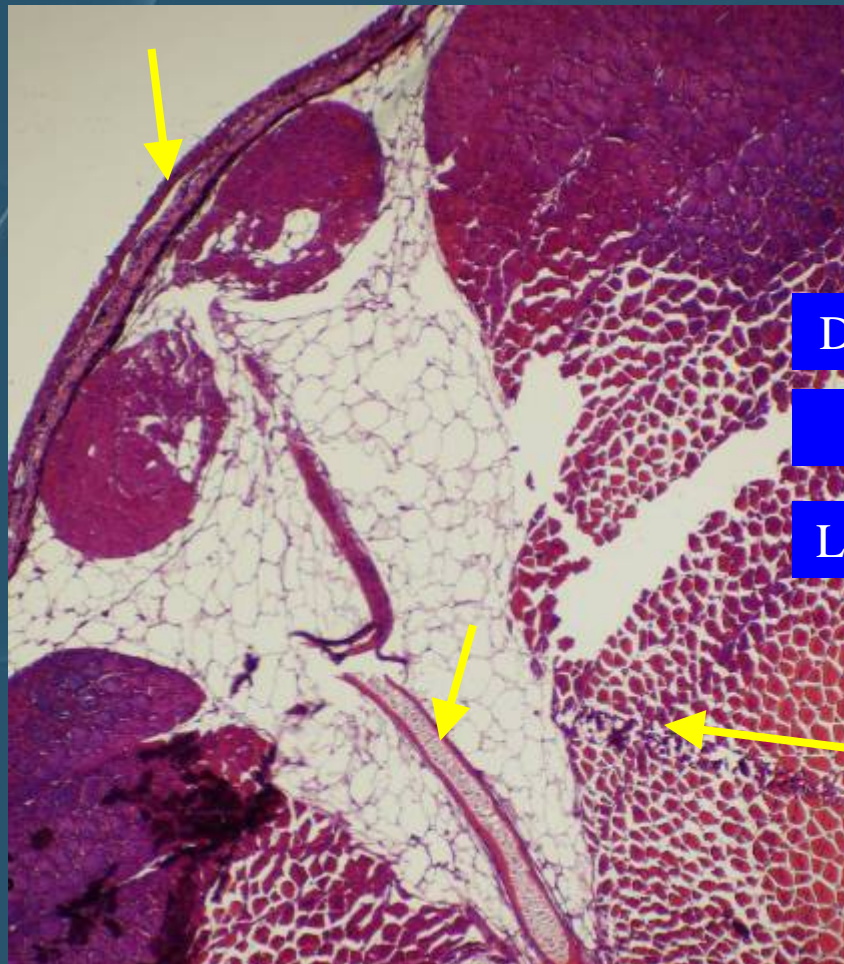


- Dark Lesion



Steatitis (Yellow Fat Disease)

- Normal

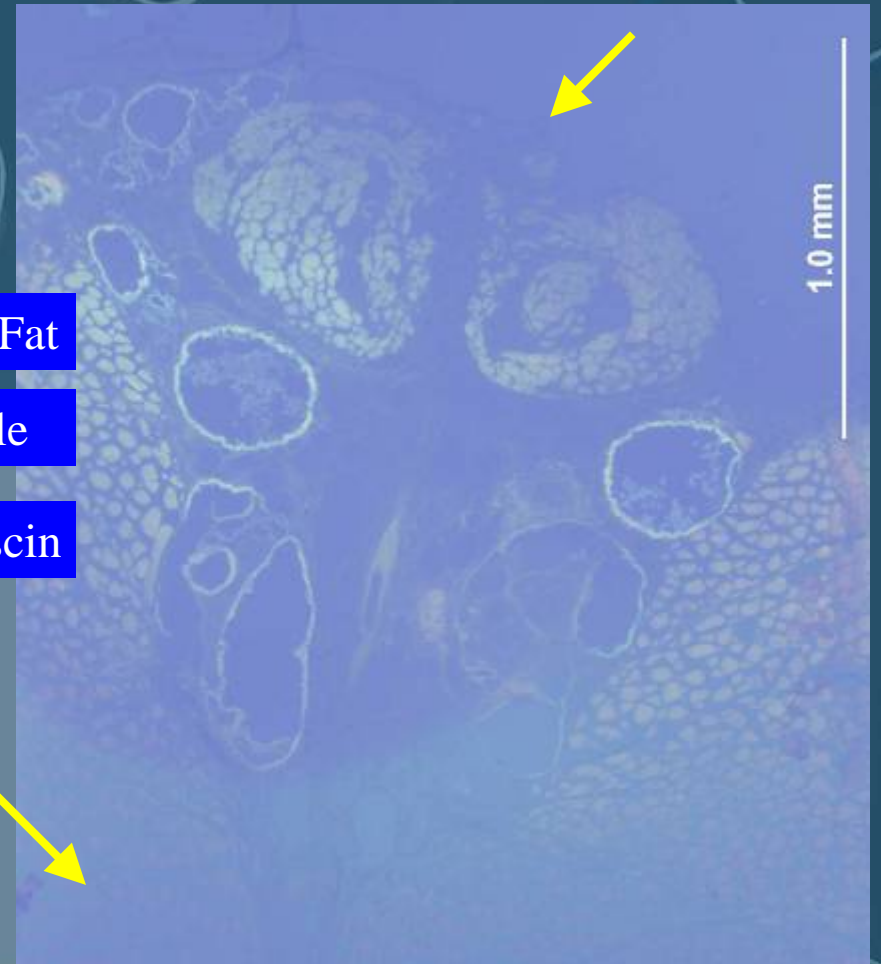


Dorsal Fat

Muscle

Lipofuscin

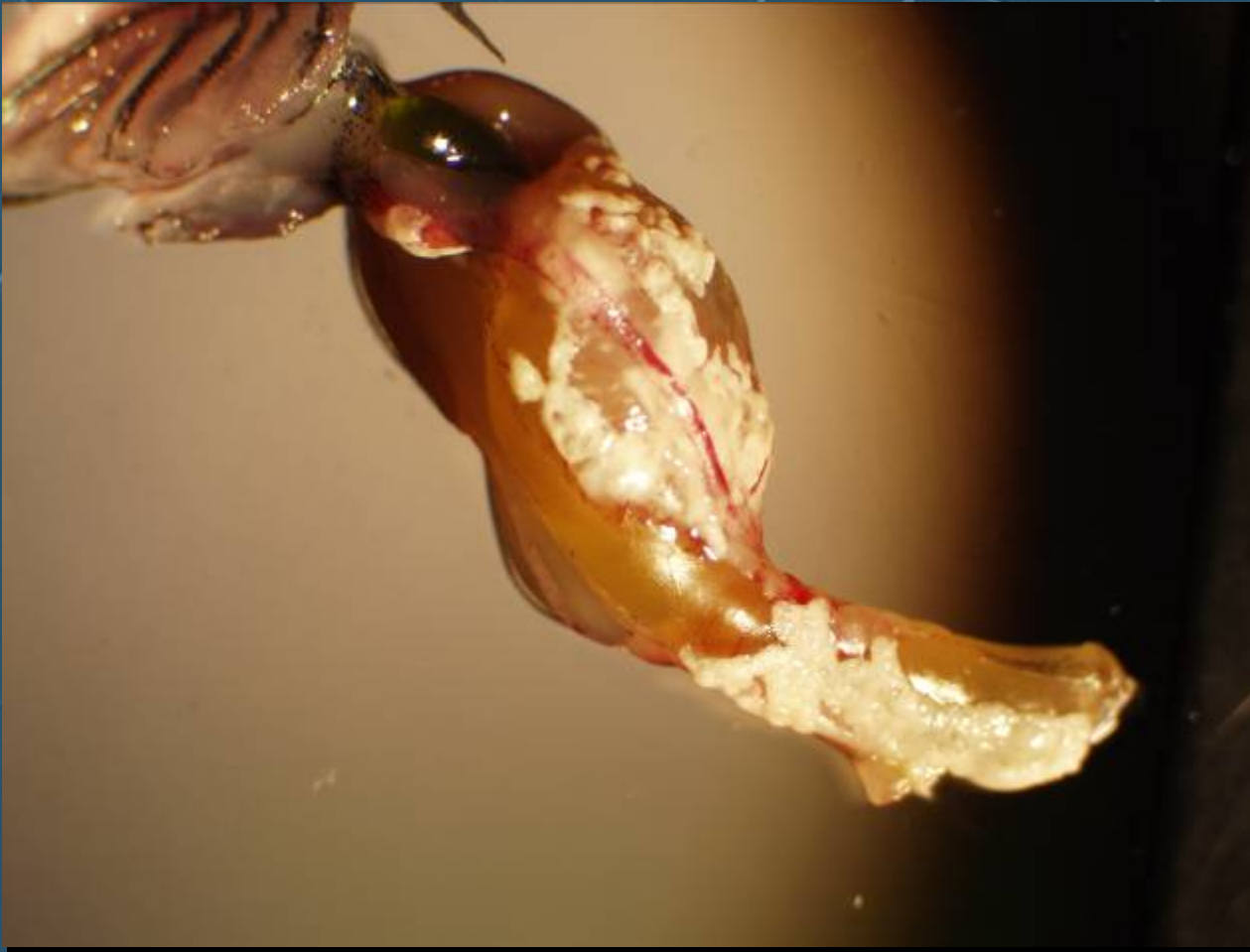
- Dark Lesion



1.0 mm



Similar to 2008?



- 2008 Late Fall Chinook
- 2008 Winter Chinook
- Steatitis (YF)
- Fat (Visceral)
- Low mortality
- Does this look familiar to any one else?



Feed analysis

- Analyzed for niacin, "sunburn" is a deficiency sign
- Peroxides and free fatty acids, rancid fats cause reduction of vitamin E, steatitis is a sign



Joy Evered



Feed analyses results

Analyses (desired values)	Starter #2	1.0 mm	1.2 mm	1.5 mm
Niacin (150-200 mg/kg feed)	>354.9	157	249	188
Vitamin E (30 IU/kg feed)	1,140	172	351	
Peroxide value ¹ (Fresh=3-10 meq/kg oil)	8.8	16	4.4	4.1
Free fatty acids* (<3%)	8.7 %	4.2 %	6.2 %	5.3 %

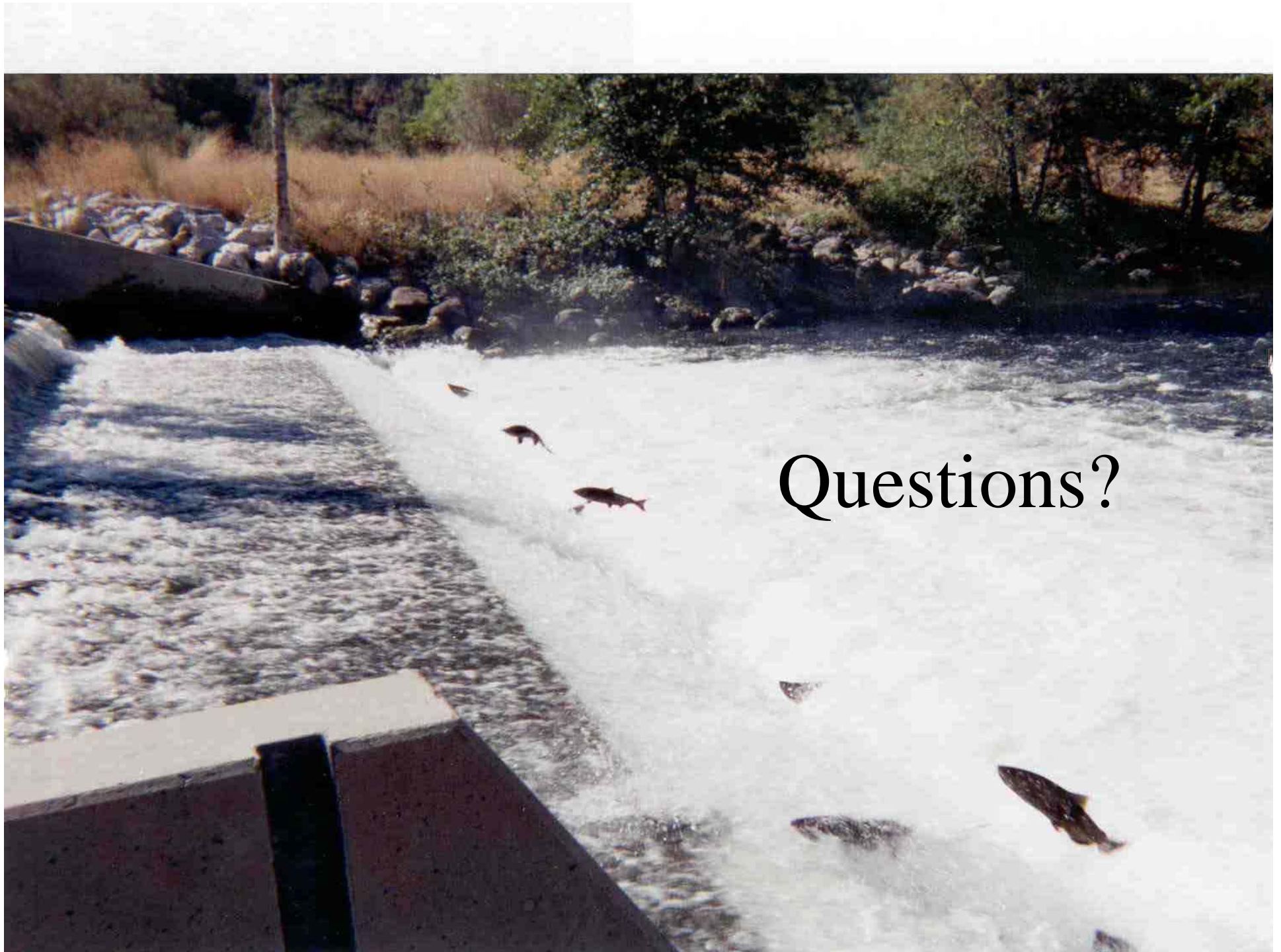
¹Oxidative rancidity

*Hydrolytic rancidity



Feed analyses results

- Was not able to analyze the first feed, Starter #1
- All feeds met the vitamin requirements of salmonids as defined by Halver (2002).
- 1.0 mm had the highest peroxide value, 16 meq/kg/oil
- Late Fall Chinook may be more sensitive to rancidity



Questions?