



**Feed changes over time, are they
having an impact on age/size at
maturity of hatchery fish?**



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Straw man questions

- ▶ Diet composition or methods of manufacture of artificial feeds
- ▶ Changes in the composition of artificial feeds
- ▶ Feeding protocols or practices



Recent changes in feed

- ▶ Method of feed manufacture
- ▶ Moisture level
- ▶ Ingredients



Method of feed manufacture

- ▶ Pelleted
- ▶ Extruded (hot)
 - Higher digestibility
 - Higher available energy



Moisture level

- ▶ BioMoist feed
- ▶ Dry feed

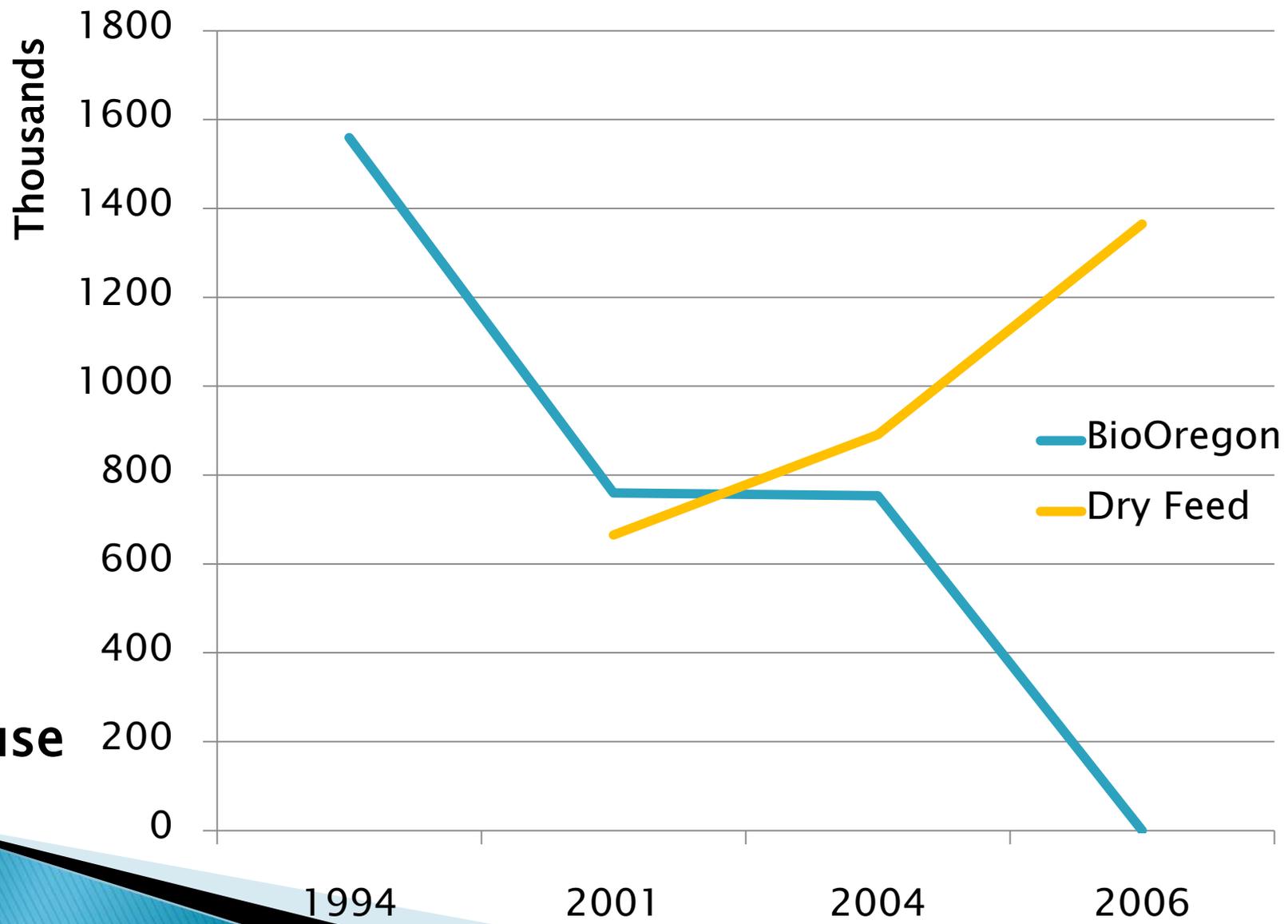


Feed comparison on dry matter basis

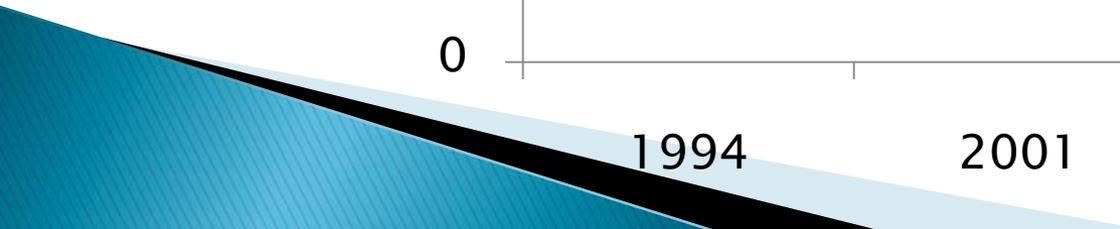
	BioVita	BioMoist
Protein	54.6	58.0
Lipid	24.0	20.7



Feed trends in the Pacific Region (R1)



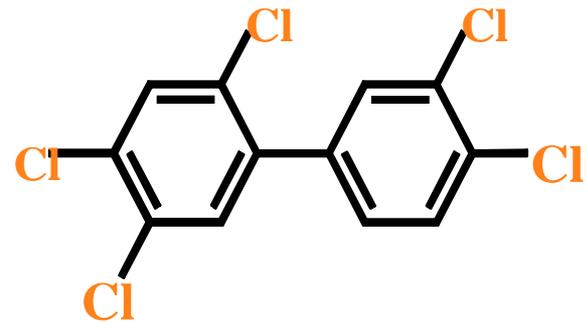
Feed use



Ingredients

▶ Endocrine disruptors

- Hormones
 - 11-Ketotestosterone
 - Phytoestrogens
- Contaminants
 - PCBs
 - Dioxin/Furans
 - Pesticides



Changes in levels of contaminants in feed

Manufacturer/ variable	Pre 1979	1999	2001-2003
A			
Total PCBs	100-230 (n = 3-4)	43 and 107 (two samples)	ND*
14 DL-PCBs	ND	6.7 and 4.4	1.4-4.0 (n = 6 of 10)
DDT metabolites	10-340 (n = 3-4)	50 and 50 (two samples)	8.4-31.0 (n = 7 of 10)
B			
Total PCBs	ND	90.2 (one sample)	ND
14 DL-PCBs	ND	5.2	0.4-3.0 (n = 7 of 14)
DDT metabolites	ND	30.7 (one sample)	4.0 (n = 1 of 14)

ND=no data; ng/g wet weight

