

# Effects of Initial Feed Timing on Triploid Rainbow Trout Fry at Grace Fish Hatchery



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# Effects of Initial Feed Timing on Triploid Rainbow Trout Fry at Grace Fish Hatchery

- Purpose of the Study
- Methods
- Results
- Implications of the Results
- Future Exploration



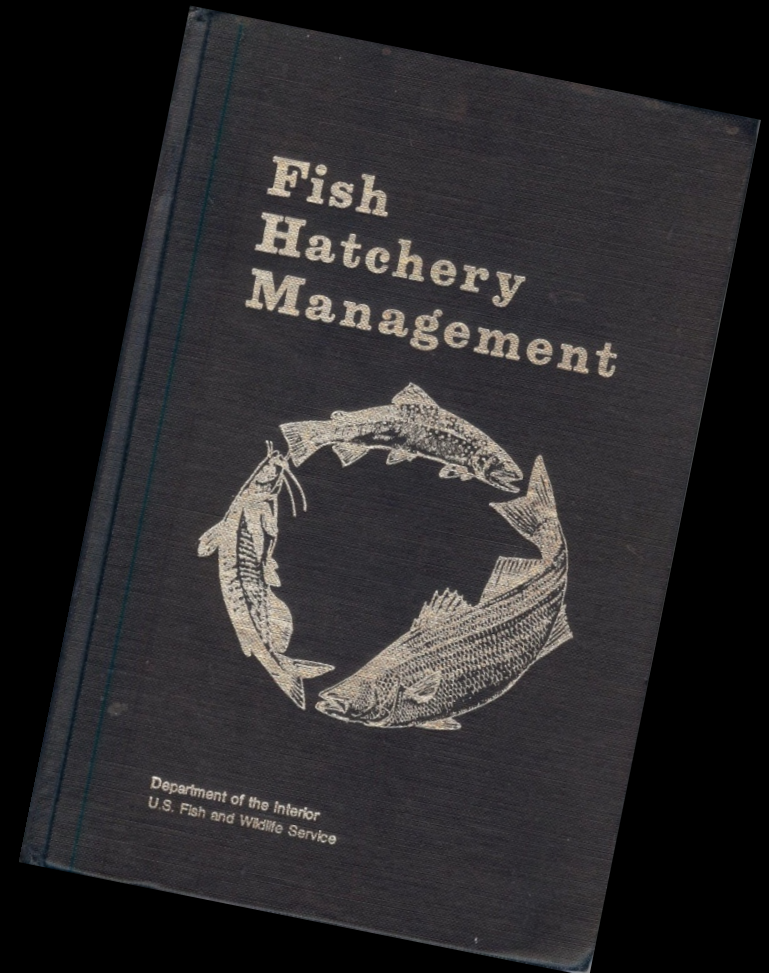
# Purpose of Feed Study

Use science based practices to develop a standard initial feed time for rainbow trout.



# Why develop a Standard?

- Quantitative vs. Anecdotal
- Wide range of suggestions in literature
  - Twongo and MacCrimmon, 1976
  - Piper et al, 1982
  - MacCrimmon and Twongo, 1980
- Improve early rearing



# Methods

## Set up

- 6 treatments
- 13, 15, 17, 19, 21 and 25 days post hatch (DPH)
- 286, 330, 374, 418, 462 and 550 TUs post hatch.
- 4 replicates
- Treatments assigned randomly





# Methods

## Rearing Unit Stocking

- Eyed eggs received from Troutlodge
- Fry hatched in upwelling incubator
- Rearing units stocked 11 DPH
- Stocked with 100 fry



# Methods

## Feeding

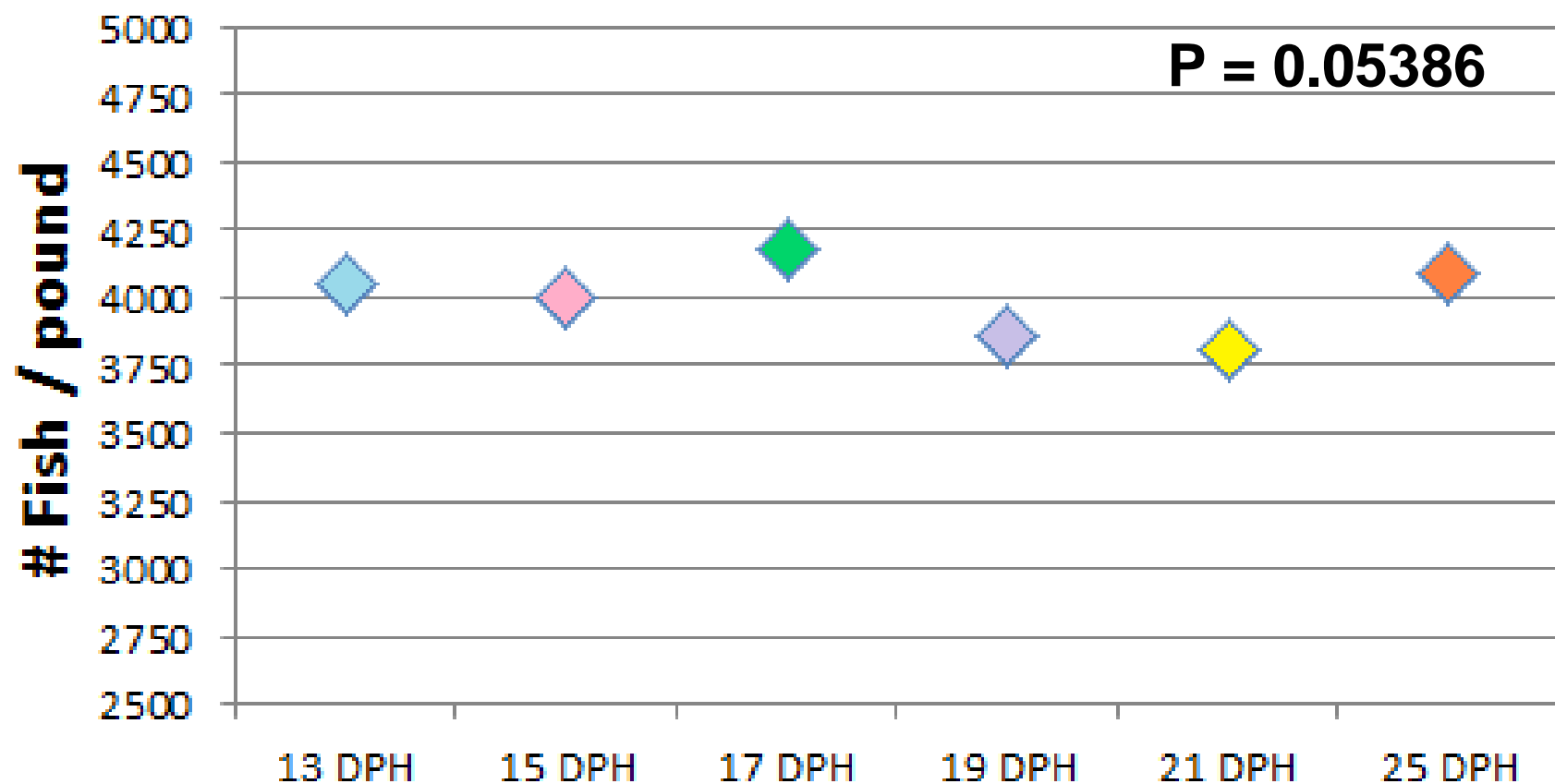
- Obtained initial length and weights
- Fed for a daily increase in length = 0.025"
- Assumed feed conversion = 1.0



# Methods

## Feeding

### Sample Count at Initial Feeding





# Methods

## Feeding

- Rearing units were cleaned once daily
- Feed adjusted daily for mortality
- Fry fed in intervals throughout the day
- Fry fed for 30 days



# Methods

## Length and Weights

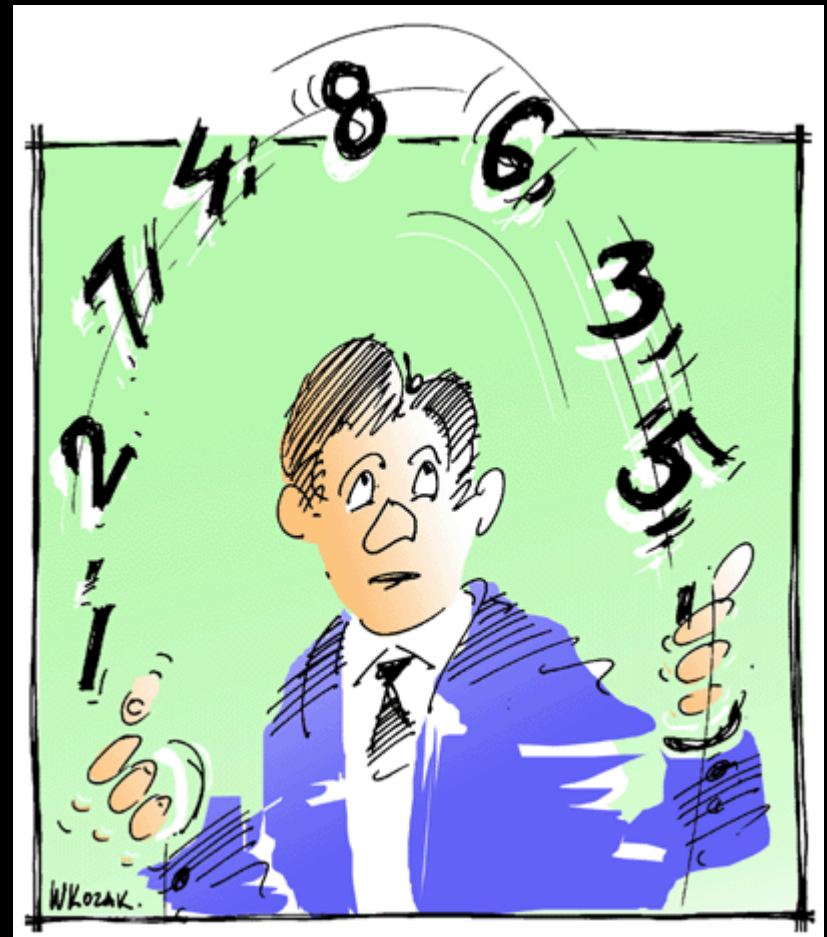
- After 30 days fry were left off feed for 1 day
- Total lengths on all individuals
- Weights on all individuals



# Results

## Statistics

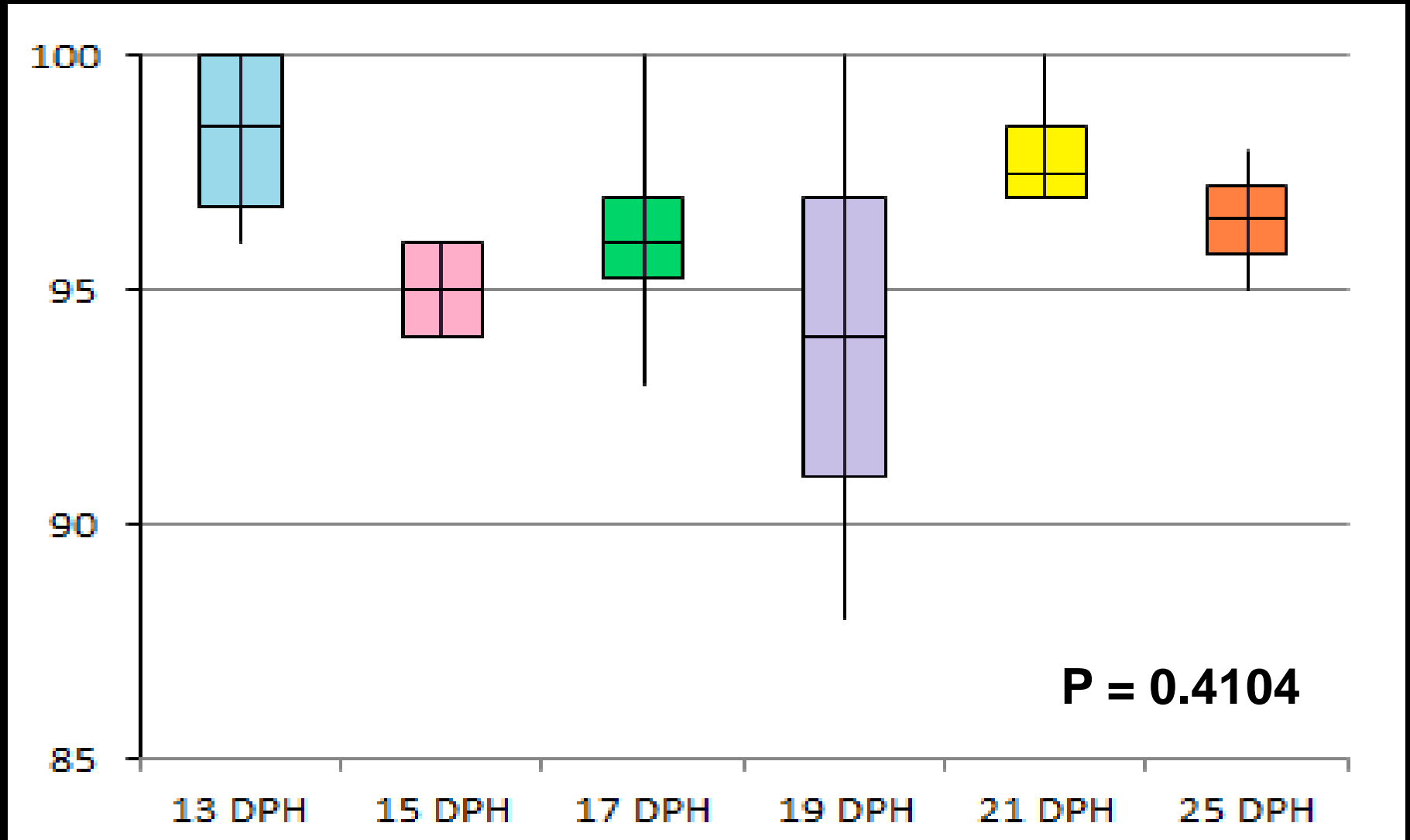
- ANOVA
- $\alpha = 0.05$
- Box plots
- Duncan's Multiple Range test





# Results

## % Survival





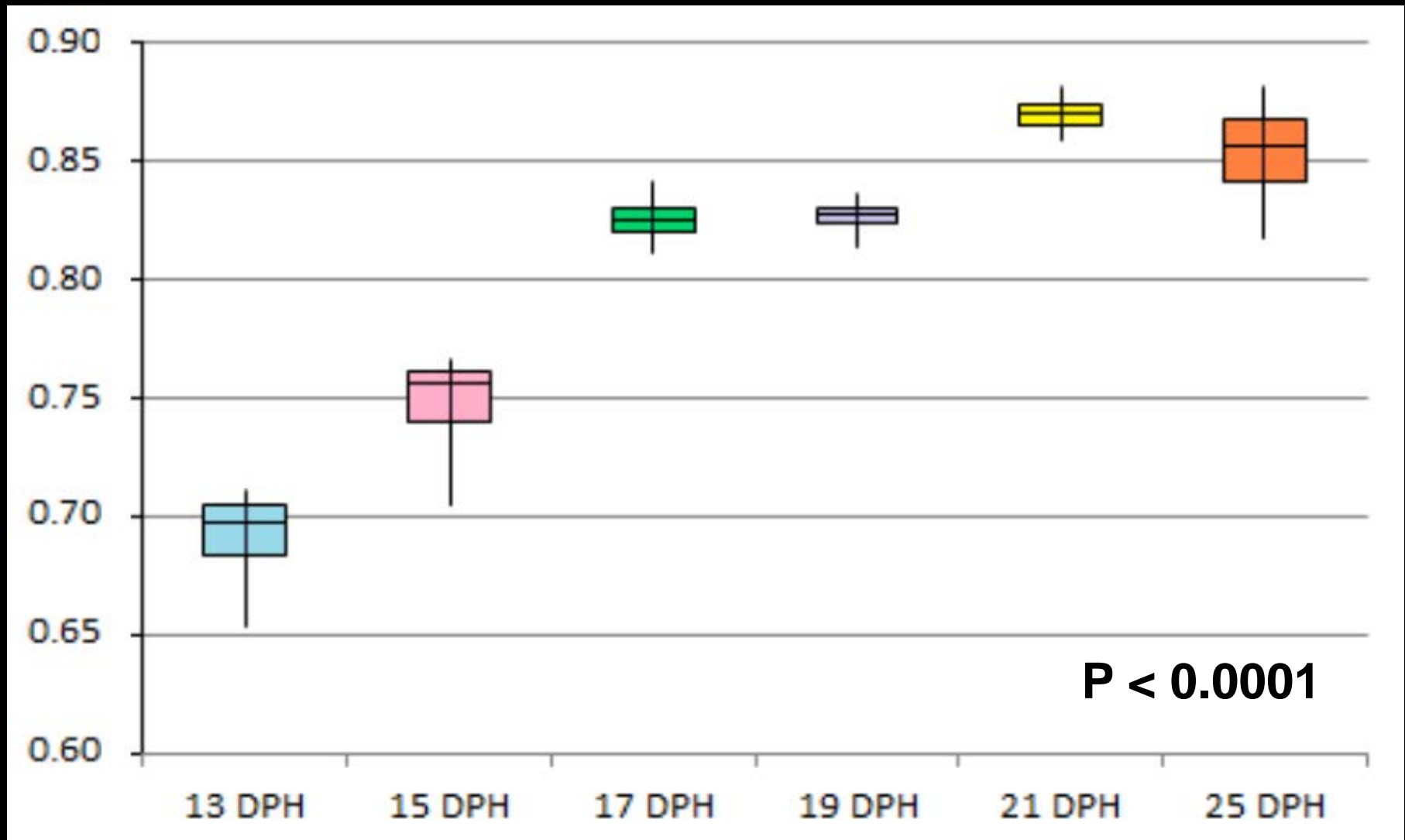
# Results

## % Survival

Treatment	Survival (%)	Duncan group
13 DPH	99.1 $\pm$ 0.30	A
15 DPH	95.0 $\pm$ 0.02	A
17 DPH	97.2 $\pm$ 0.34	A
19 DPH	95.6 $\pm$ 0.59	A
21 DPH	98.5 $\pm$ 0.17	A
25 DPH	96.6 $\pm$ 0.03	A

# Results

## Weight (g)







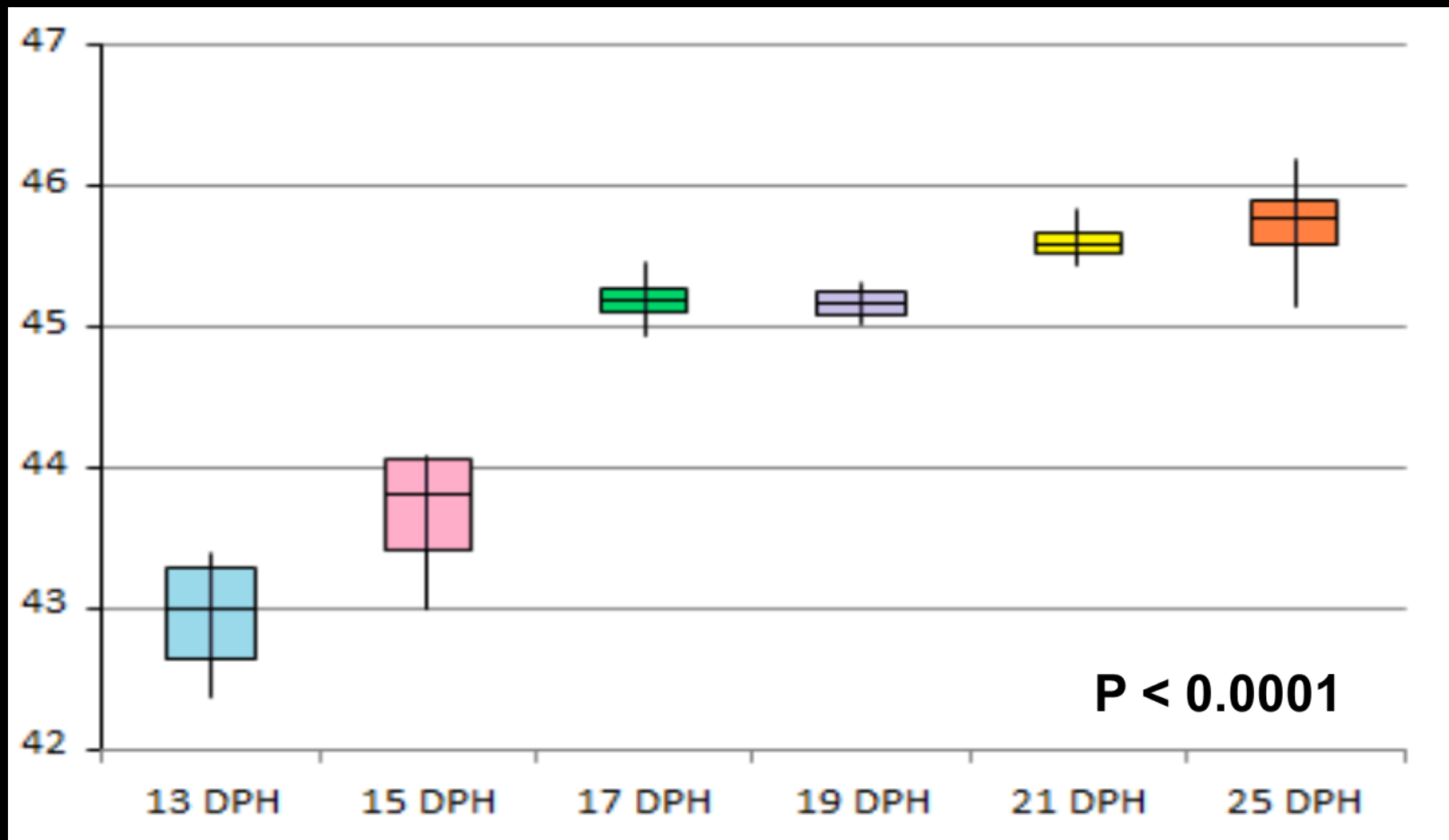
# Results

## Weight (g)

Treatment	Weight (g)	Duncan group
13 DPH	$0.69 \pm 0.013$	A
15 DPH	$0.75 \pm 0.014$	B
17 DPH	$0.83 \pm 0.006$	C
19 DPH	$0.83 \pm 0.005$	C
21 DPH	$0.87 \pm 0.005$	D
25 DPH	$0.85 \pm 0.013$	C, D

# Results

## Length (mm)





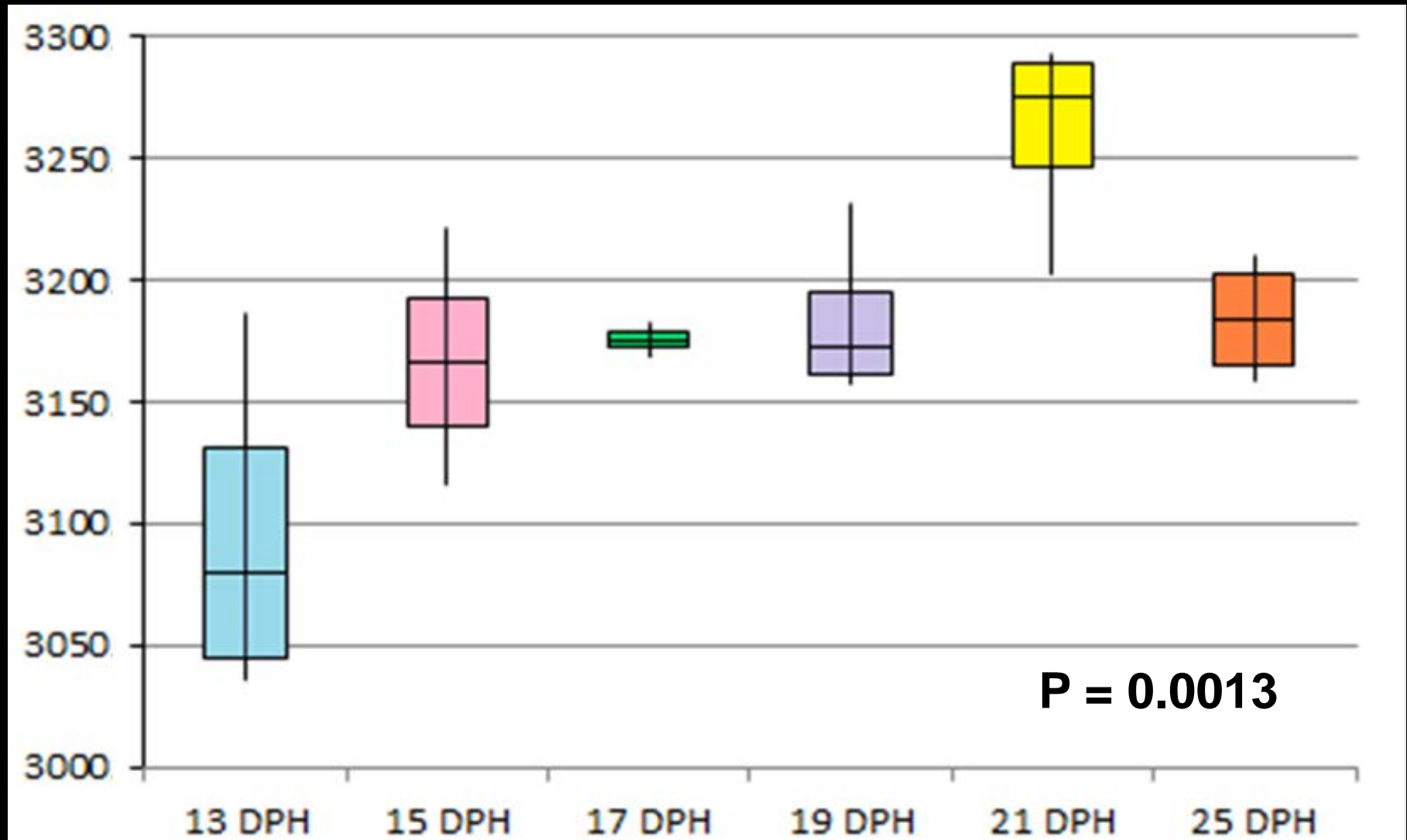
# Results

## Length (mm)

Treatment	Length (mm)	Duncan group
13 DPH	$42.9 \pm 0.24$	A
15 DPH	$43.7 \pm 0.25$	B
17 DPH	$45.2 \pm 0.11$	C
19 DPH	$45.2 \pm 0.06$	C
21 DPH	$45.6 \pm 0.08$	C
25 DPH	$45.7 \pm 0.22$	C

# Results

Condition Factor ( $C = Y \cdot 10^{-7}$ )





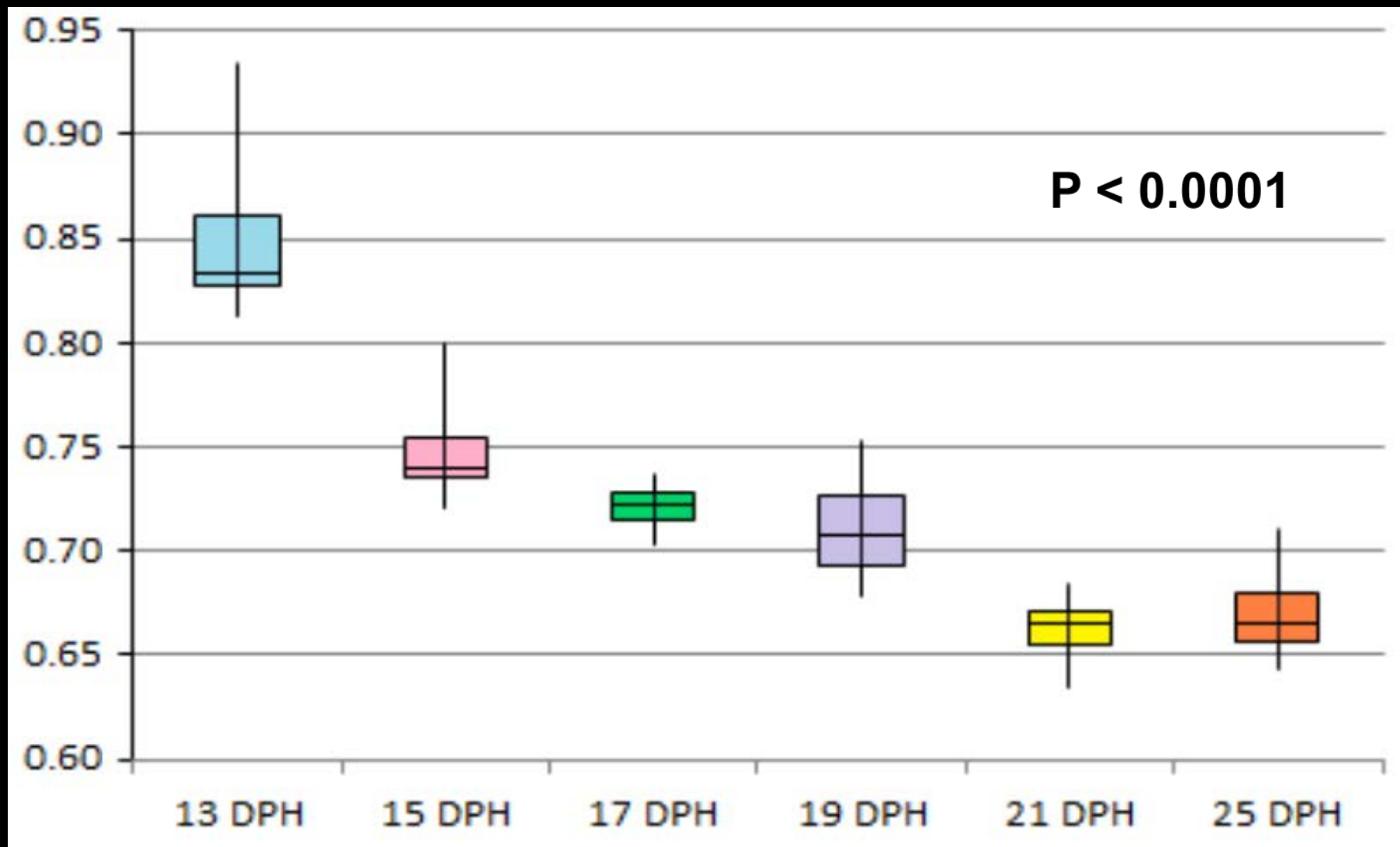
# Results

Condition Factor ( $C = Y \cdot 10^{-7}$ )

Treatment	Condition factor (C)	Duncan group
13 DPH	$3095 \pm 36$	A
15 DPH	$3167 \pm 22$	B
17 DPH	$3176 \pm 4$	B
19 DPH	$3183 \pm 18$	B
21 DPH	$3261 \pm 22$	C
25 DPH	$3184 \pm 11$	B

# Results

Feed Conversion (gram feed / gram wt. gain)







# Results

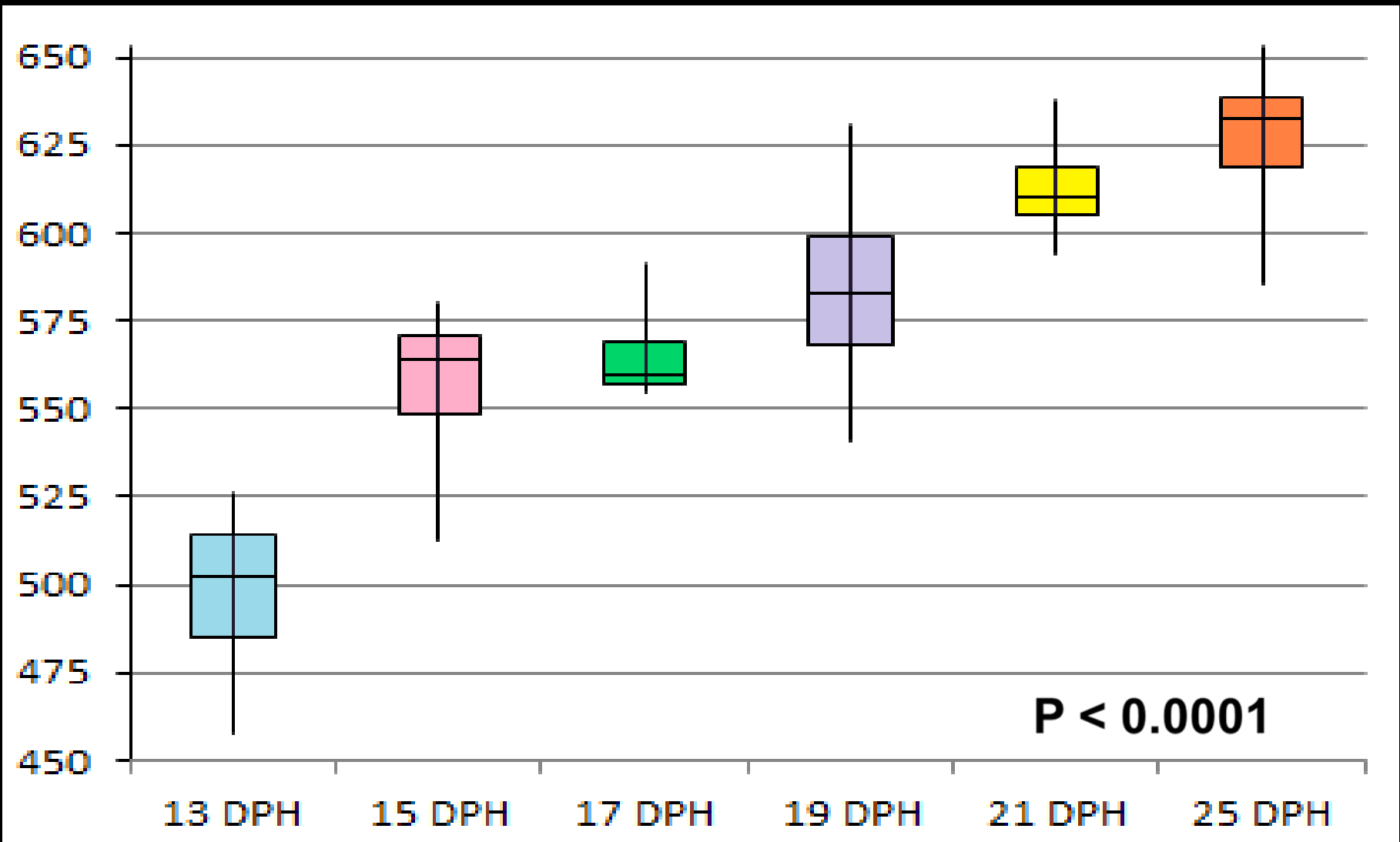
## Feed Conversion (gram feed / gram wt. gain)

Treatment	Feed Conversion	Duncan Group
13 DPH	$0.85 \pm 0.03$	A
15 DPH	$0.75 \pm 0.02$	B
17 DPH	$0.72 \pm 0.01$	B
19 DPH	$0.71 \pm 0.02$	B, C
21 DPH	$0.66 \pm 0.01$	D
25 DPH	$0.67 \pm 0.01$	C, D



# Results

## % Weight Gain





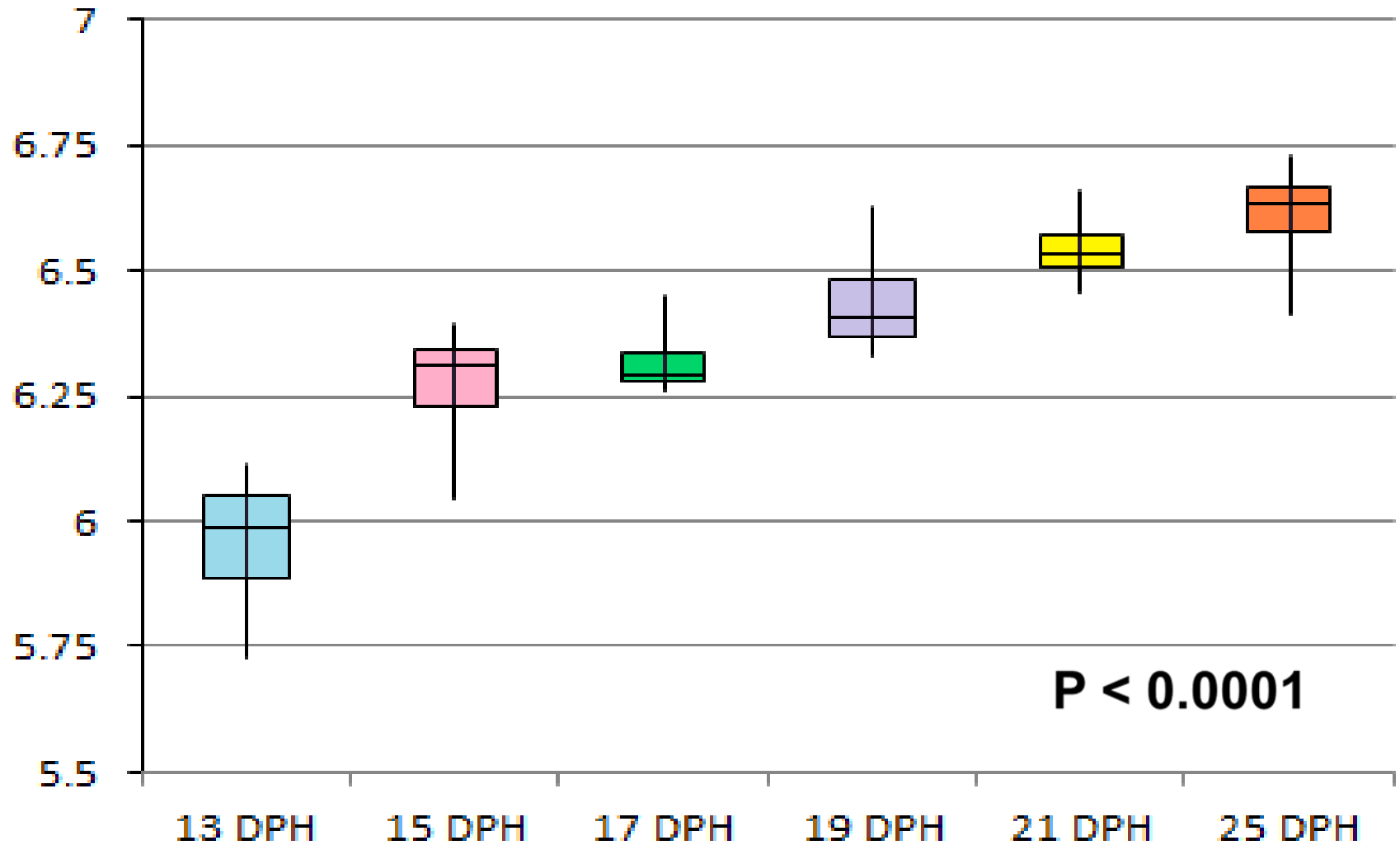
# Results

## % Weight Gain

Treatment	Percent weight gain	Duncan group
13 DPH	497.2 $\pm$ 14.7	A
15 DPH	555.5 $\pm$ 14.8	A
17 DPH	566.5 $\pm$ 8.5	A, B
19 DPH	584.5 $\pm$ 18.4	B
21 DPH	613.0 $\pm$ 9.2	B
25 DPH	625.6 $\pm$ 14.4	C

# Results

## Specific Growth Rate (% wt. gain / day)





# Results

## Specific Growth Rate (% wt. gain / day)

Treatment	Specific growth rate	Duncan group
13 DPH	$5.95 \pm 0.08$	A
15 DPH	$6.26 \pm 0.08$	A
17 DPH	$6.32 \pm 0.04$	A, B
19 DPH	$6.41 \pm 0.09$	B
21 DPH	$6.54 \pm 0.04$	B
25 DPH	$6.60 \pm 0.07$	C



# Results

## Which Day Will Grace Hatchery Feed?

- Day 21 and Day 25 similar
- Best weight gain = 25 DPH
- Less variation in size = 25 DPH
- 25 DPH = More time for fish to swim-up
- Grace Hatchery will feed at 25 DPH  
(25 DPH = 550 temperature units post hatch)



# Implications

- Improve early rearing
- Feeding later will not starve fish
- Cost savings  
(feed conv. improve by ~20%)
- Consistency



# Future Exploration

- Scale
- What about day 25 through day 40?
- What happens after 30 days on feed?
- Other Species
- Other Hatcheries





# Acknowledgements

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# Questions

