

**Effects of Post Pellet Liquid
Fat Application (PPLA)
Accuracy in Low Energy Diets
on Broiler Performance**

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Feed Mill Challenges

- **Energy is an expensive nutrient.**
 - **Over application of fat results in inventory loss (“shrink”) in the mill.**
 - **Under application of fat results in inventory gain.**

Feed Mill Challenges

- **Feed mill managers typically spend more time and money monitoring the level of fat in feed than any for other ingredient.**
- **Variation in the amount of applied fat of individual feed samples will typically be in the range of 80 - 120% of theoretical.**
- **Satisfactory variation is 90 – 110% of theoretical.**

Factors that Contribute to Fat Variation in Finished Feed

- **Ingredient matrix values**
- **Types of PPLA equipment**
- **Application rates**
- **Sampling**
- **Quantity of pellet fines**
- **Analytical method**
- **Feed processing rates**

Post Pellet Liquid Application (PPLA)

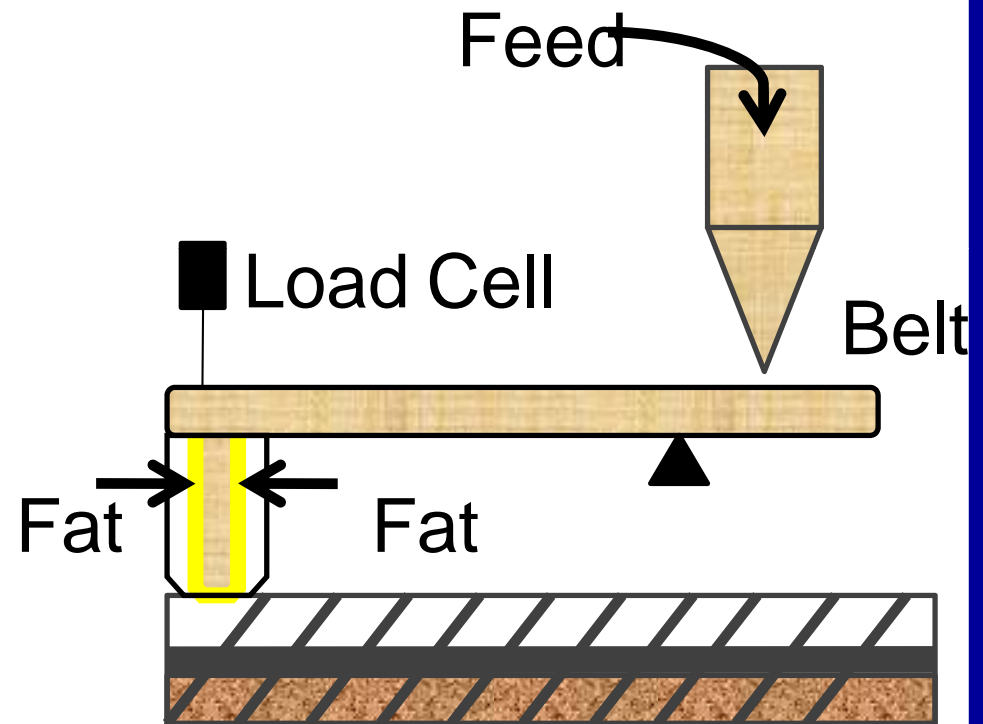
- **Ingredients typically applied by PPLA include:**
 - **Liquid Enzymes**
 - **Fat**
 - **Molasses**
 - **Vitamins**

PPLA

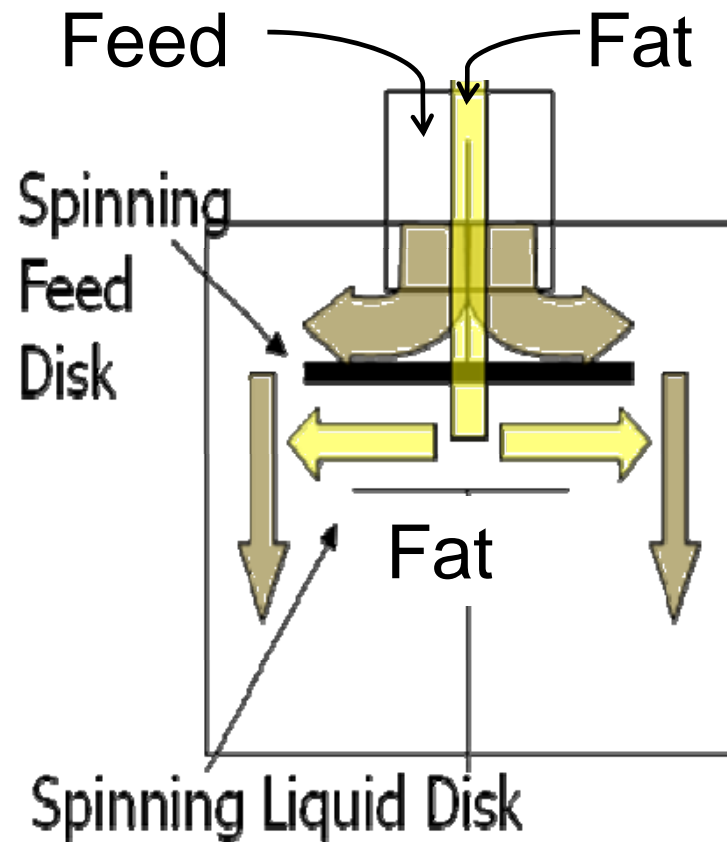
Continuous process that involves complex equipment:

- **Dry Flow System for Feed**
 - **Volumetric Feeder**
 - **Gravimetric Feeder**
 - **Mass Flow Feeder**
- **Liquid Flow System for Fat**
 - **Mechanical Liquid Meter**
 - **Coriolis Meter**
- **Spray Nozzles for fat application**

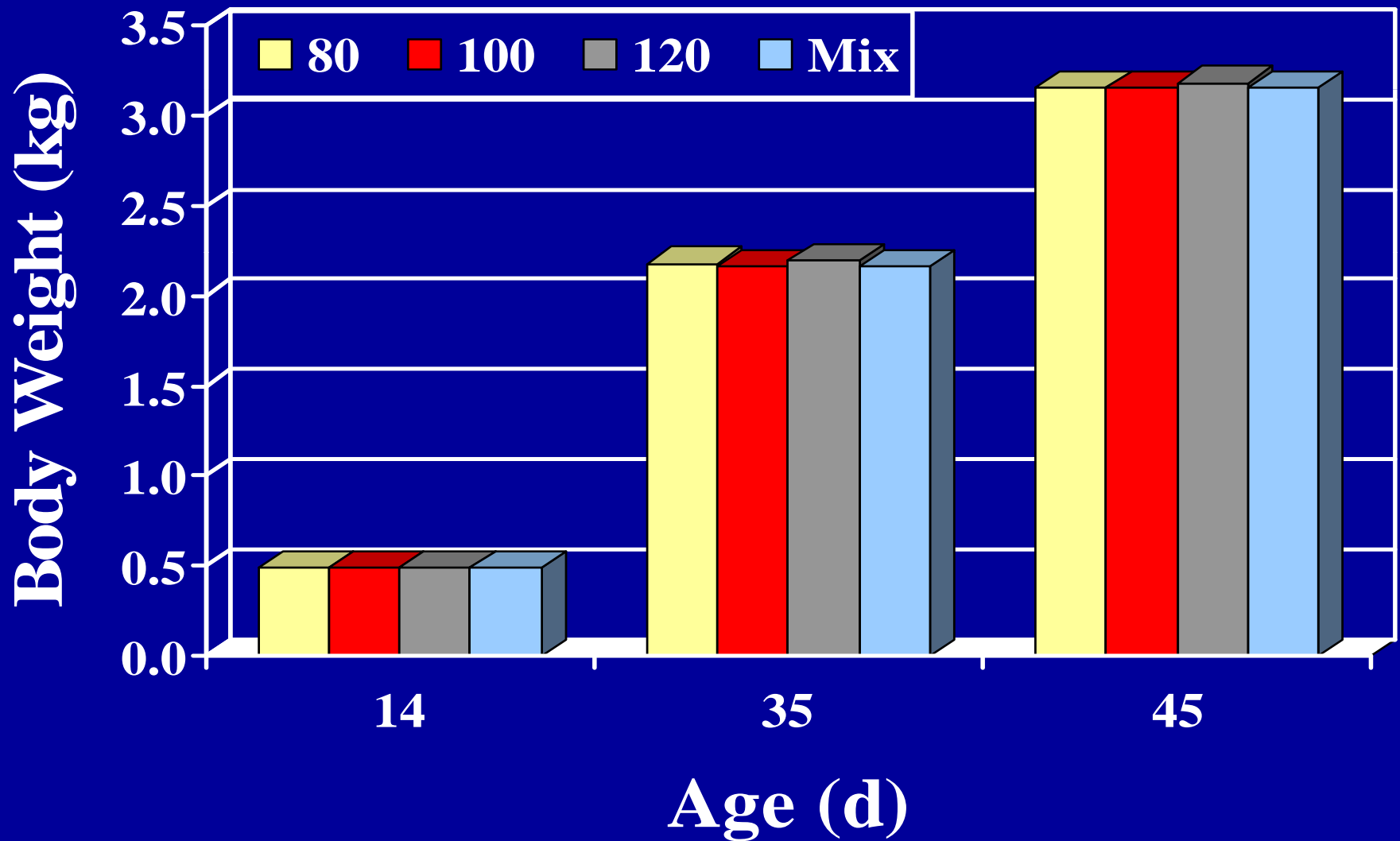
Types of PPLA Equipment



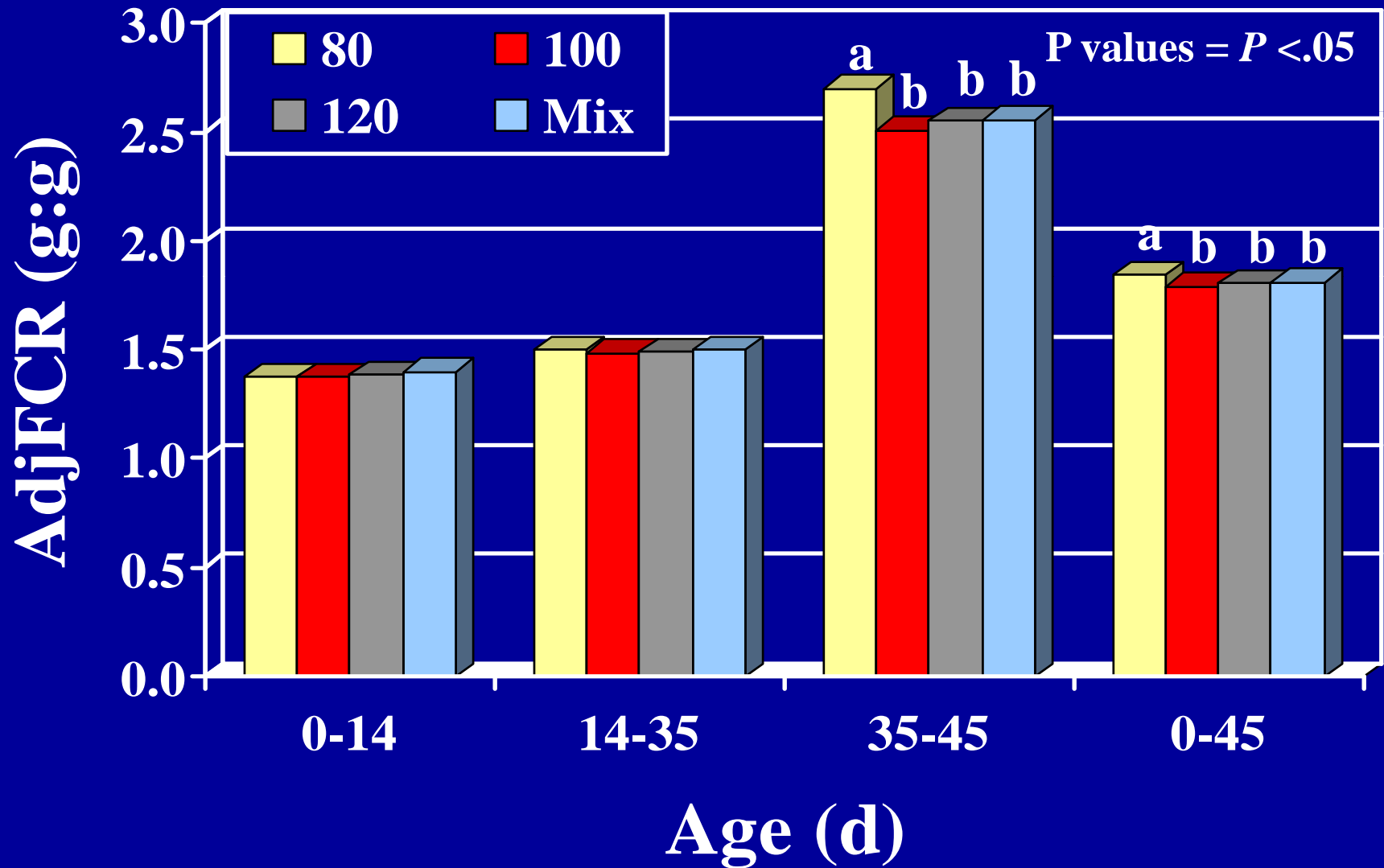
Types of PPLA Equipment



Body Weight



Adjusted Feed Conversion Ratio



Hypothesis

**Inaccurate post pellet liquid
application of fat increases
production costs.**

Objective

Determine the effect that various amounts of post pellet liquid fat application error has on broiler performance in low energy diets.

Diets

- **The treatments were created from a common corn-soy basal diet.**
- **Fat was applied to the basal diet post pelleting at three levels: 80%, 100%, and 120% of theoretical and in the mixer at 100%.**
- **The starter diet was crumbled.**
- **Grower and finisher diets were pelleted.**

Basal Diets

Ingredients	Starter	Grower	Finisher
Corn	53.18	60.45	66.38
Soybean Meal (48%)	37.44	30.41	24.85
Dicalcium Phosphate	2.09	1.84	1.51
Calcium Carbonate	0.95	0.99	0.95
Vit/TM Premix	1.10	1.10	1.10
Amino Acids	0.28	0.20	0.44
Poultry Fat	4.97	4.99	4.77

Dietary Specifications

Nutrient	Starter	Grower	Finisher
ME, kcal/kg	3,035	3,100	3,150
CP, %	22.85	20.00	18.00
Lysine, %	1.30	1.12	1.10
Met + Cys, %	0.94	0.82	0.75
Calcium, %	0.90	0.85	0.75
Total P, %	0.63	0.54	0.44
AvP, %	0.45	0.40	0.34

Feeding Schedule

Diets	Amount	Days Fed
Starter	2.0 lbs (0.91 kg)	0-14
Grower	7.0 lbs (3.18 kg)	14-35
Finisher	8.0 lbs (3.63 kg)	35-42

Treatments

- **P80:** Diet with 80% of the theoretical fat added PPLA.
- **P100:** Diet with 100% of the theoretical fat added PPLA.
- **P120:** Diet with 120% of the theoretical fat added PPLA.
- **M100:** Diet with 100% of the theoretical fat added in the mixer.

Experimental Design

- **There were 32 experimental pens of 32 Heritage chicks each.**
- **There were eight replicate pens for each of the four treatments total.**
- **BW and feed intake were recorded at 0, 14, 35, and 42 d.**
- **FCR was adjusted for mortality (AdjFCR).**

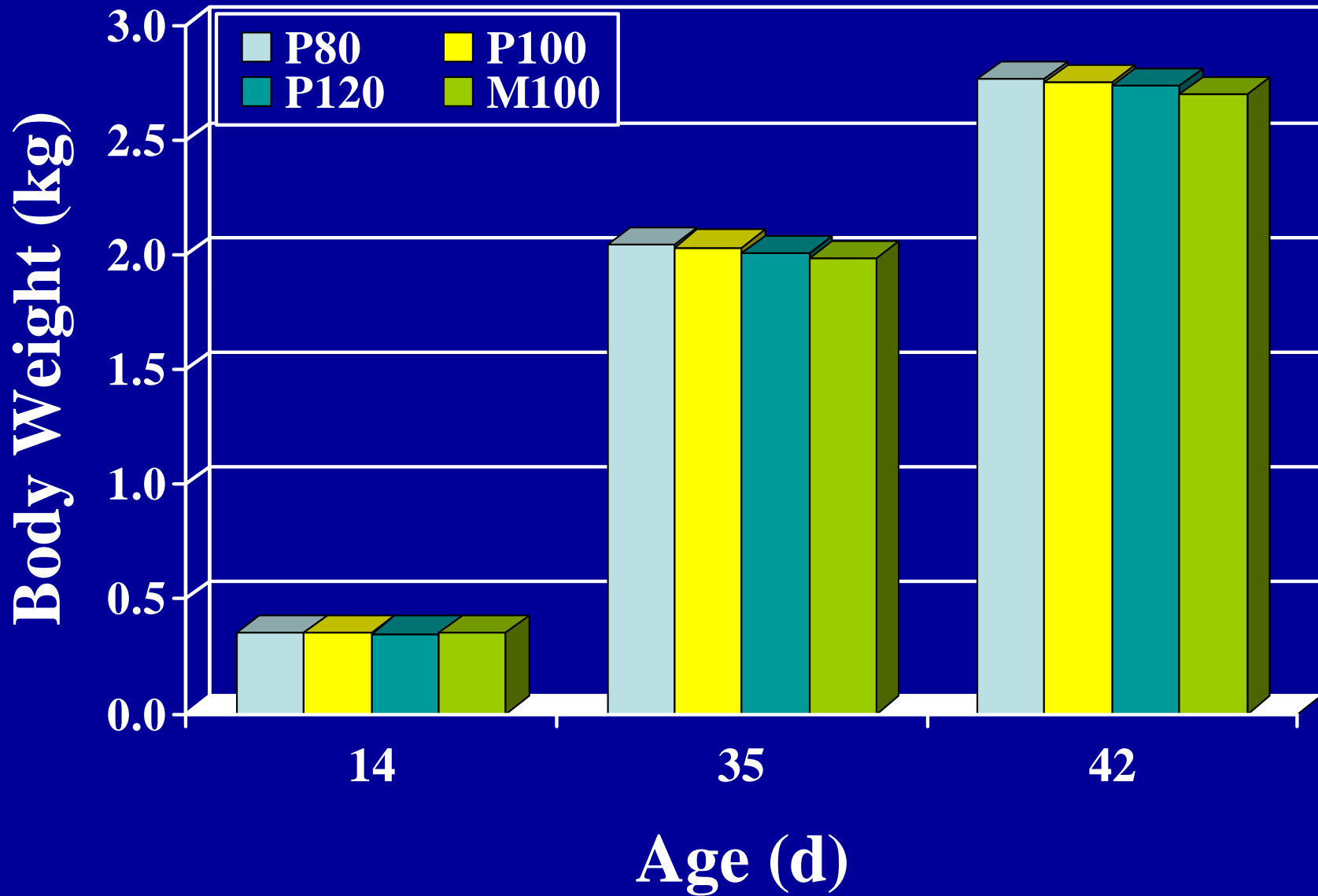
Statistical Design

- **Completely Randomized Design**
- **Proc GLM procedure of SAS**
- **Means were partitioned by LS Means**
- **Significance set at $P < 0.05$**

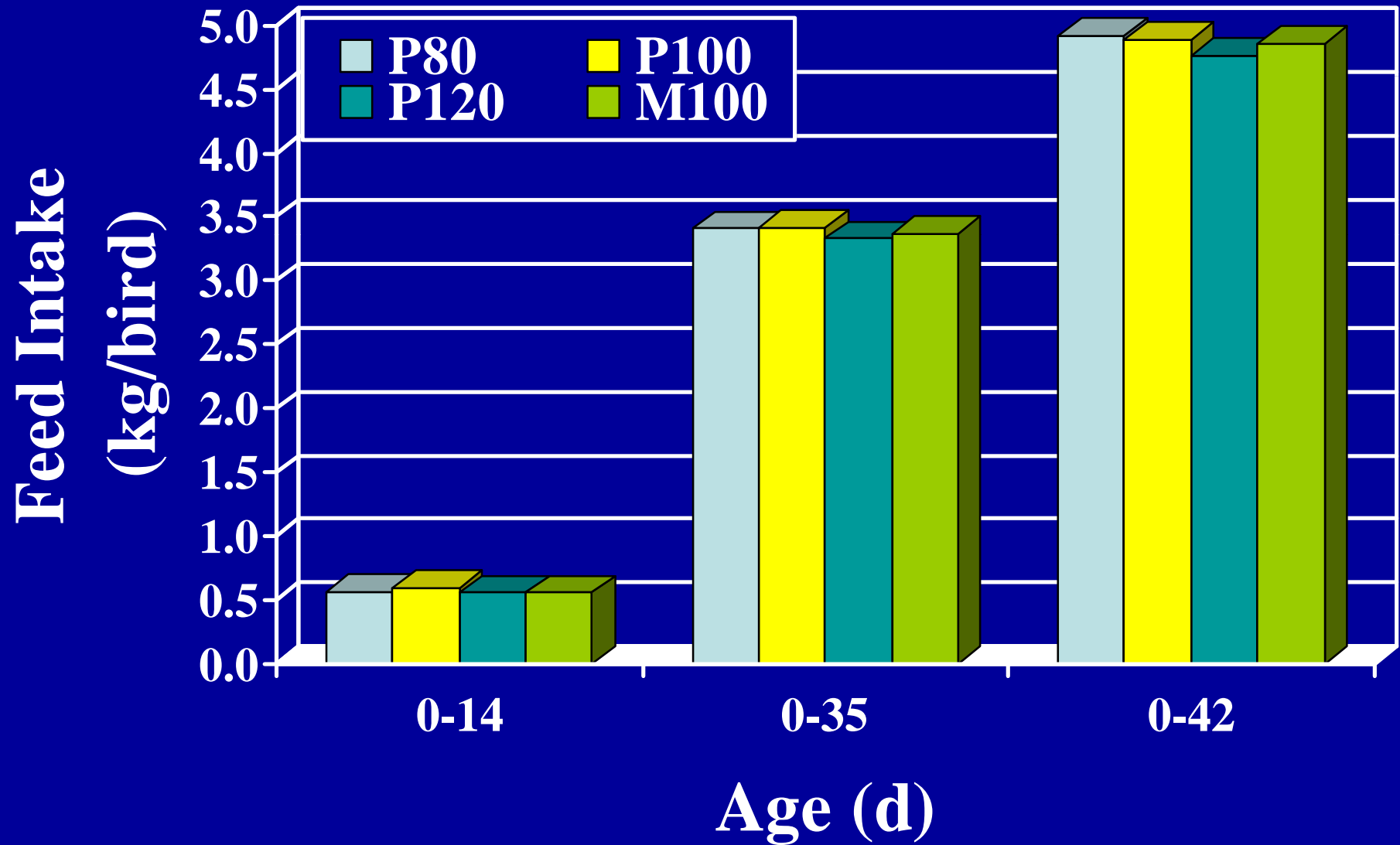
Finished Feed Analysis (% Fat)

	P80	P100	P120	M100
Starter -Theoretical	5.46	6.82	8.18	6.82
Starter -Theoretical	5.06	7.21	7.92	5.75
Starter - % Theoretical	74	106	116	84
Grower -Theoretical	5.59	6.99	8.38	6.99
Grower -Theoretical	5.41	7.03	8.33	6.11
Grower - % Theoretical	77	101	119	87
Finisher -Theoretical	5.53	6.91	8.29	6.91
Finisher -Theoretical	5.93	6.97	8.24	7.4
Finisher - % Theoretical	86	101	119	107

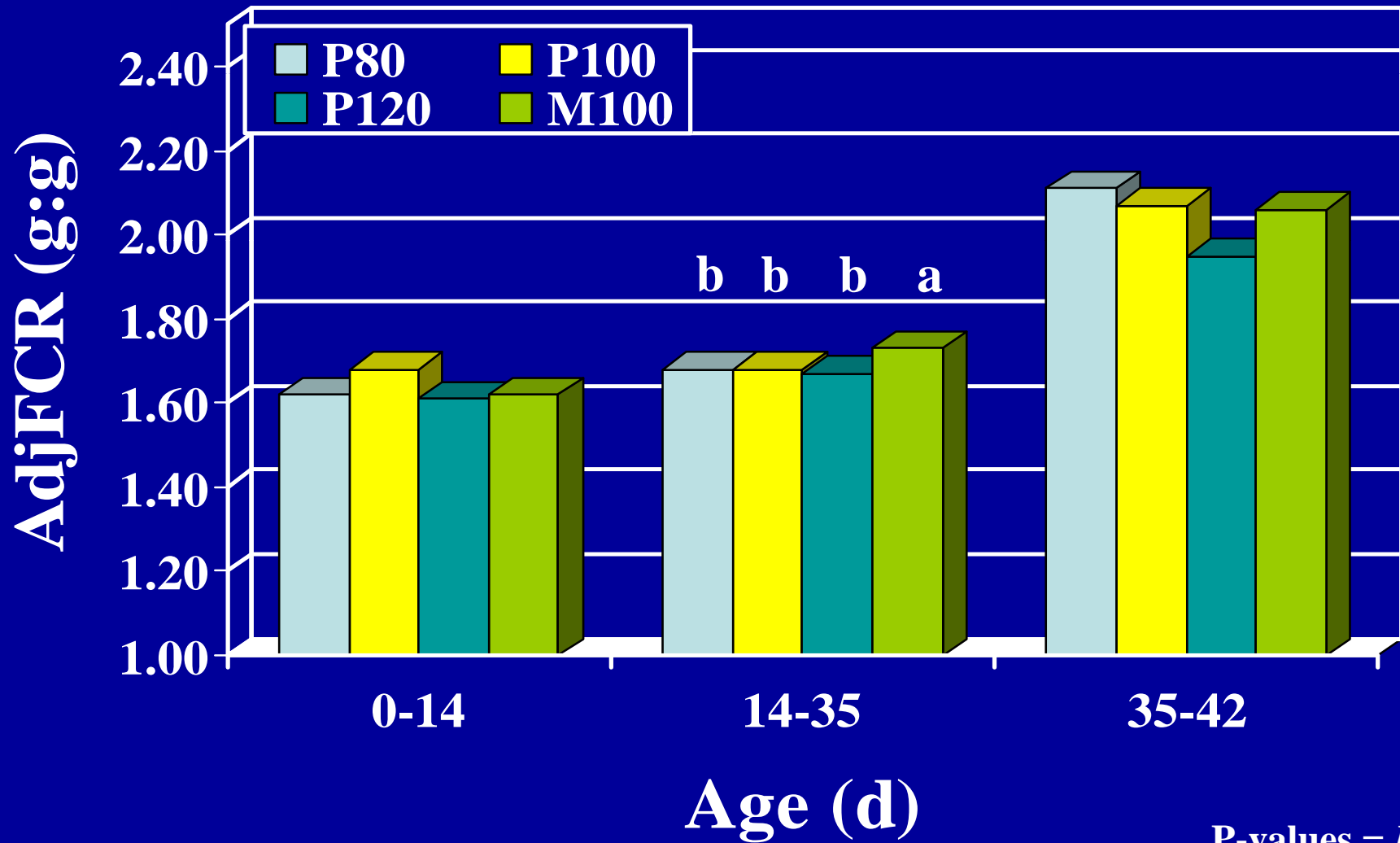
Body Weight



Feed Intake

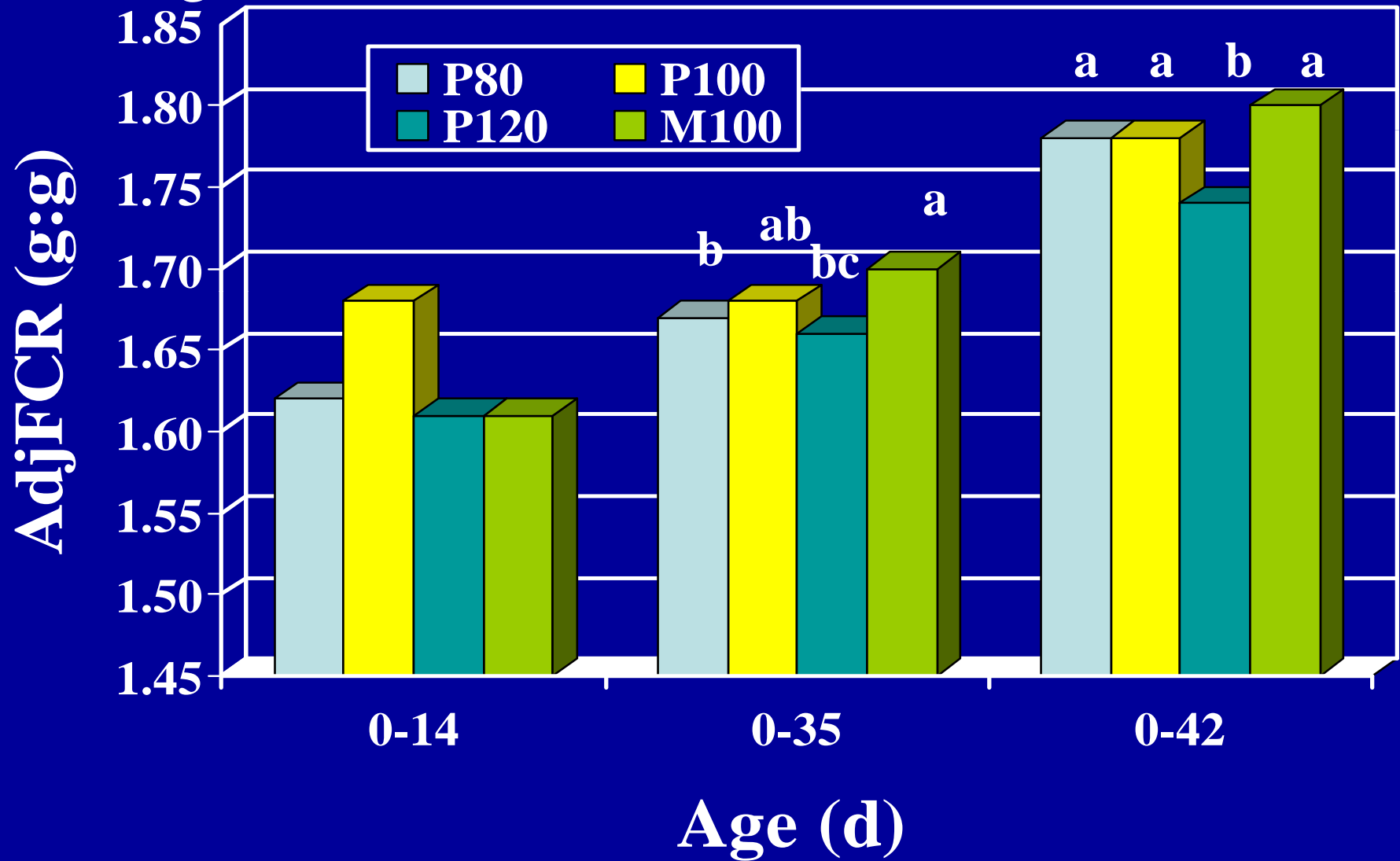


Adjusted Feed Conversion Ratio



P-values = $P < .05$

Adjusted Feed Conversion Ratio



P-values = $P < .05$

Discussion

- **There were no effects on BW.**
- **Birds fed the 120% fat diet from 0 to 42 d exhibited improved AdjFCR in comparison to the other treatments (1.74 vs. 1.78, 1.78, and 1.80) as would be consistent with greater dietary ME.**

Discussion

- **The results of this study did not indicate that the under-application of fat (80% relative to 100%) produced poorer AdjFCR when males reached 2.7 kg BW at 42 d.**

Conclusions

- **The results indicate older birds require higher levels of fat (ME) as shown by the improved FCR of birds fed the 120% target.**

Questions?

