

The effect of maternal growth strategies on hatching parameters and broiler performance

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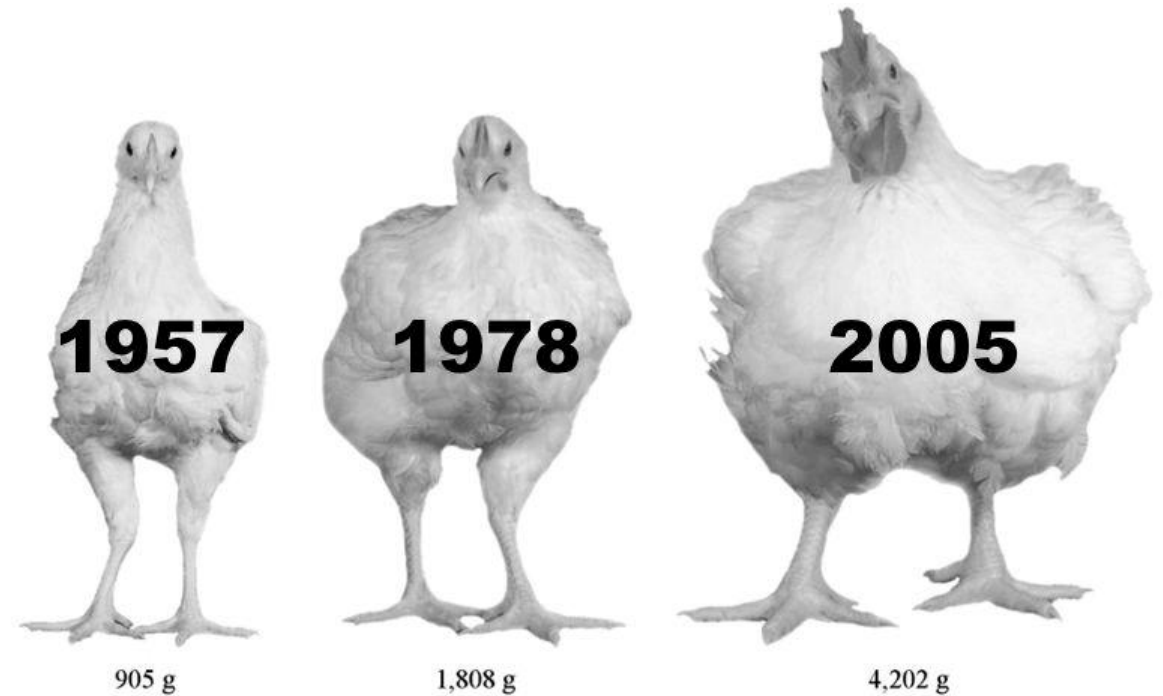
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Introduction

- Degree of broiler breeders (BB) feed restriction,
 - ❖ depends on intended growth curve.
 - ❖ affects hatching eggs and offspring performance (Afrouziyeh et al., 2021).
- Offspring from BB with relaxed feed restriction were 3.9% heavier than those from BB feed restricted (Humphreys, 2020).



Three different breeds of broilers, raised on the exact same diet (Zuidhof et al., 2014)

Objectives

To investigate the effects of different maternal growth strategies on

- ▶ Hatching parameters
- ▶ Offspring (broiler) performance.

Hypotheses

- ❖ Maternal growth curves will affect offspring growth.
- ❖ Broiler breeders (BB) fed ad-libitum → Increased BW →
 - High egg hatchability
 - Increased offspring hatch BW
 - High offspring performance

than when BB are fed restricted based on the breeder recommended BW (STD).

Materials and Methods

Maternal Source flock Ross 308 (PFS)

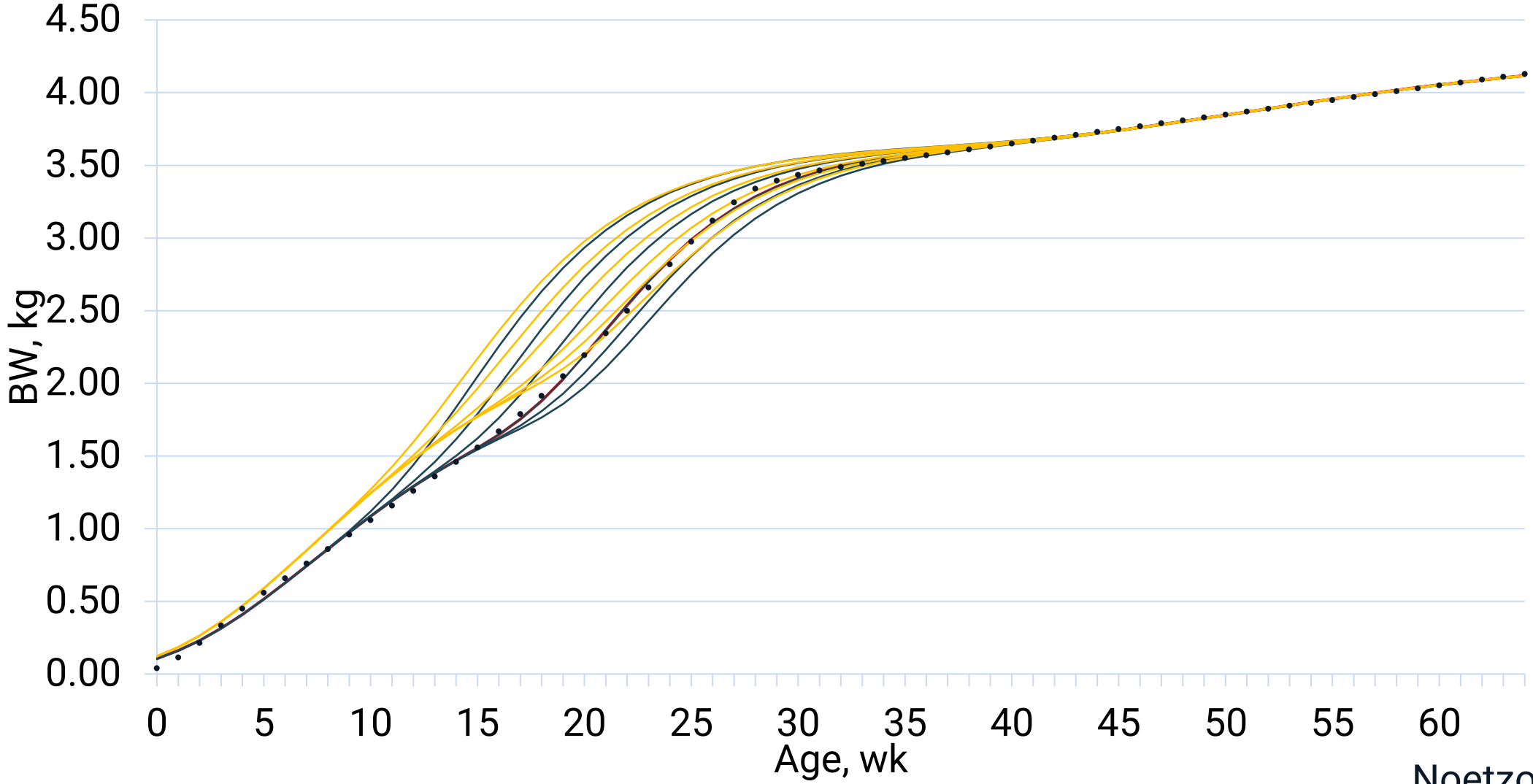
Experiment	Maternal (PFS)	Growth Curves	n of eggs (progeny)	Total
1	Feed restricted	12	13	156
2	Adlib	-	25	25
	STD	1	25	25
Total				206



Precision Feeding System (PFS)

Experiment 1: Twelve Maternal growth trajectories

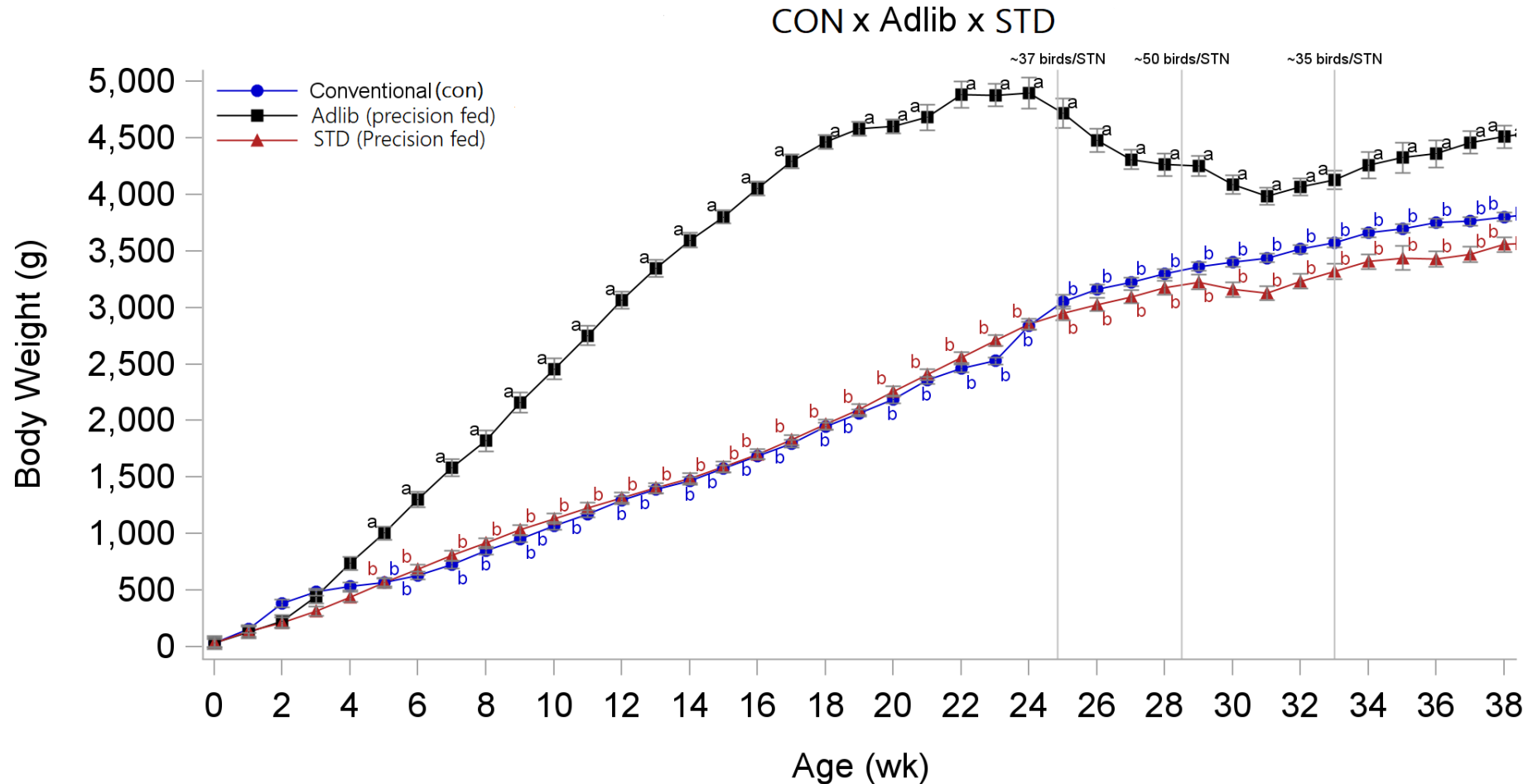
Growth Curves



Noetzold, 2021

Experiment 2: Maternal degree of feed restriction

- BB fed ad-libitum (adlib)
- BB fed restricted based on the standard target BW (std)



P = < 0.001

Progeny Flock management

At 32 weeks of maternal age, broiler chicks were randomly assigned to CONV or PFS from:

- Maternal growth curves (Exp 1)
- Maternal degree of feed restriction (Exp 2)



Conventional System (CONV)

Exp 1: n=42

Exp 2: n=12



Precision Feeding System (PFS)

Exp 1: n=96

Exp 2: n=32

Data Collection

Hatching Parameters

- Hatchability of eggs
- Egg fertility
- Embryonic mortality
- Hatch window
- Newly-hatched chick weight
- Chick measurement and quality
 - ✓ Chick length, shank length
 - ✓ Activity, leg conformation, naval area, residual yolk

Broiler Growth Performance

- Daily and total feed intake
- Feed conversion ratio
- Broiler weekly body weight
- Carcass traits (weight of breast muscle and fat pad)

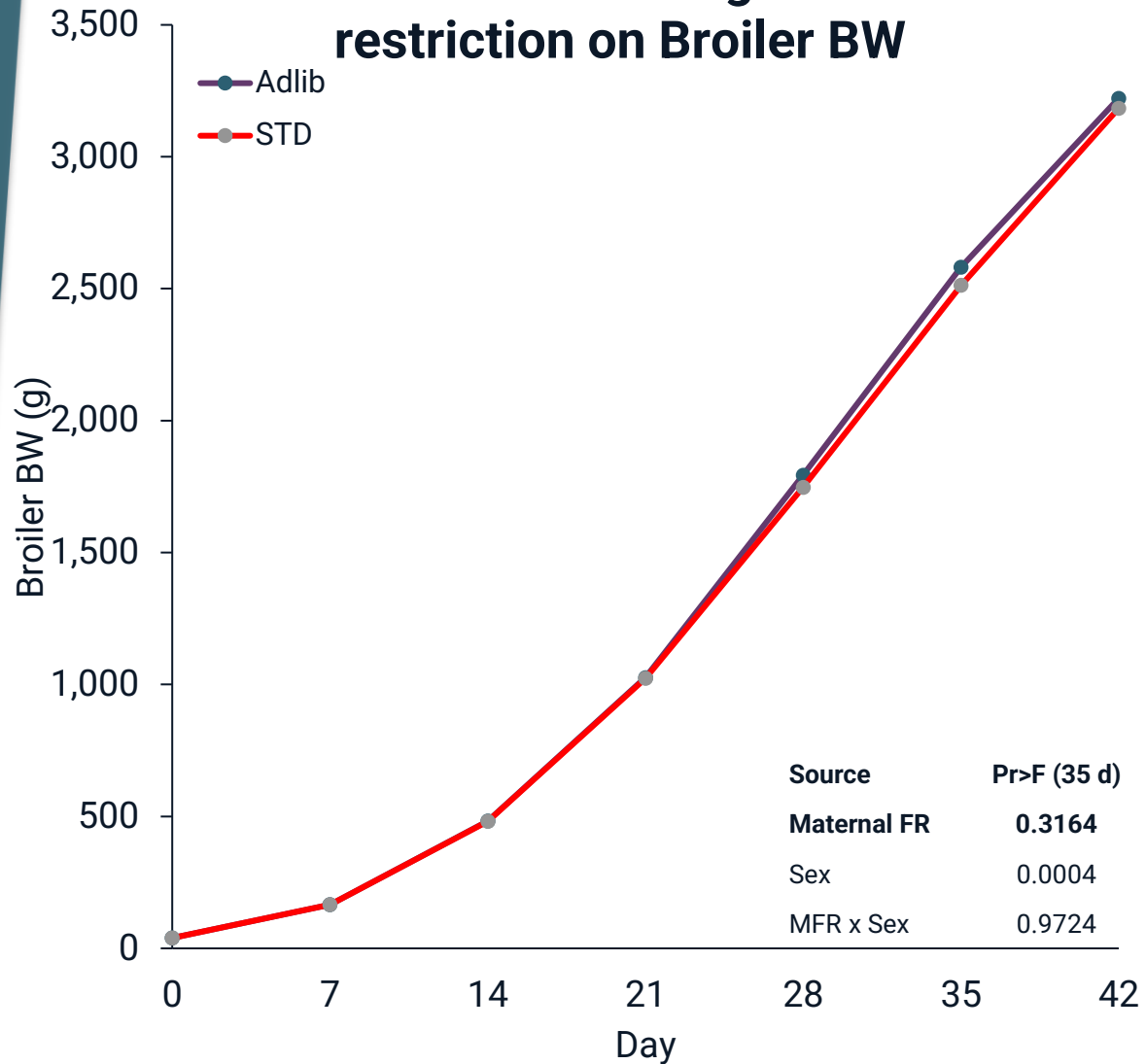
Statistical Analyses



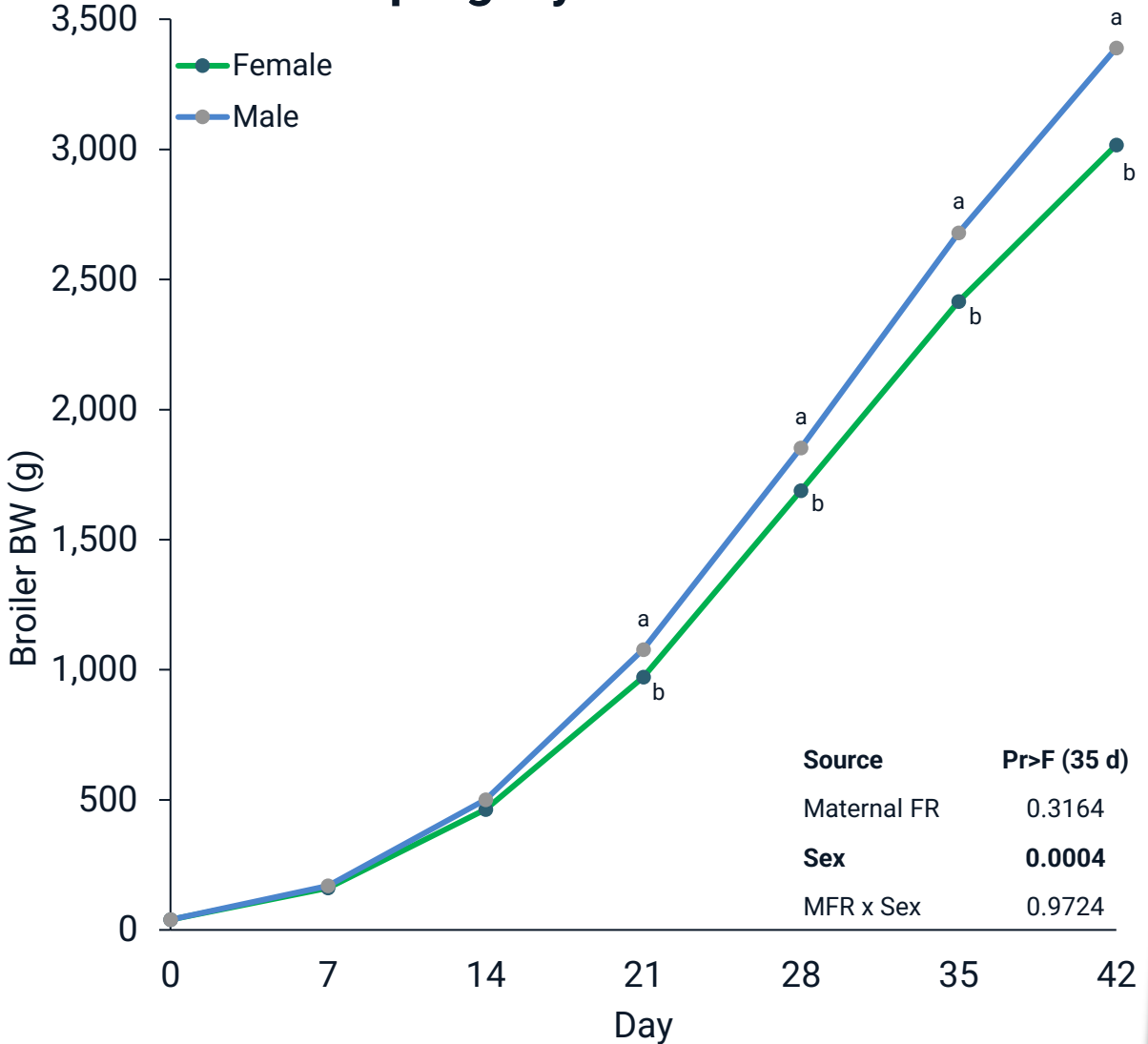
- A completely randomized design:
 - Exp 1: 6×2 factorial treatment arrangement
 - 6 levels of MaxPG x 2 levels of EG
 - Exp 2: 2×2 factorial treatment arrangement
 - ADLIB or STD x Female or Male
- Bird – Replicate unit (PFS)
- Pen – Experimental unit (CONV)
- Maternal growth trajectories, degree of feed restriction and progeny sex – Fixed variables
- Progeny feeding system – Random variable
- Analysis of variance test + Tukey adjusted separation of means

Body weight of broilers

Effect of maternal degree of feed restriction on Broiler BW

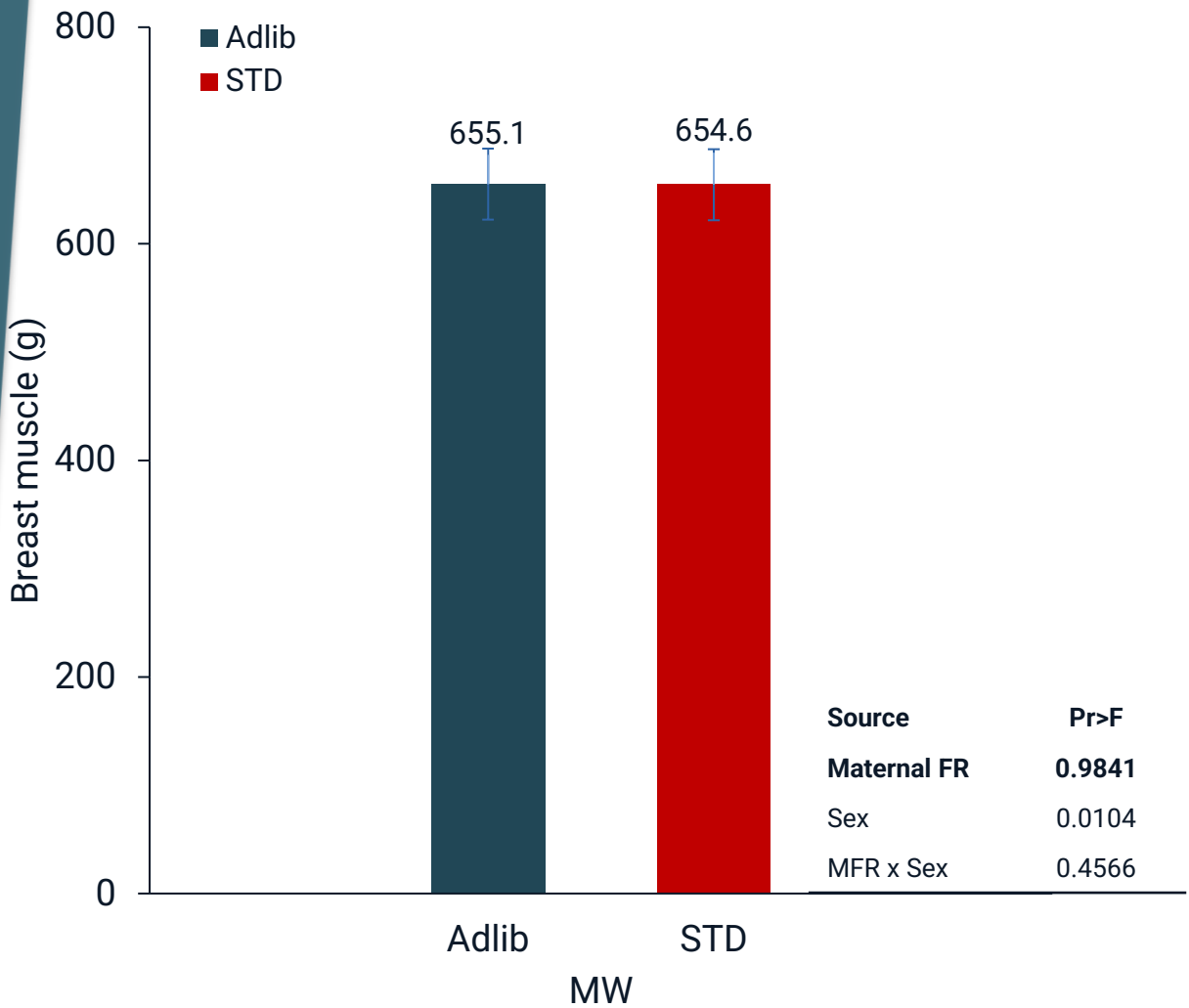


Effect of progeny sex on broiler BW

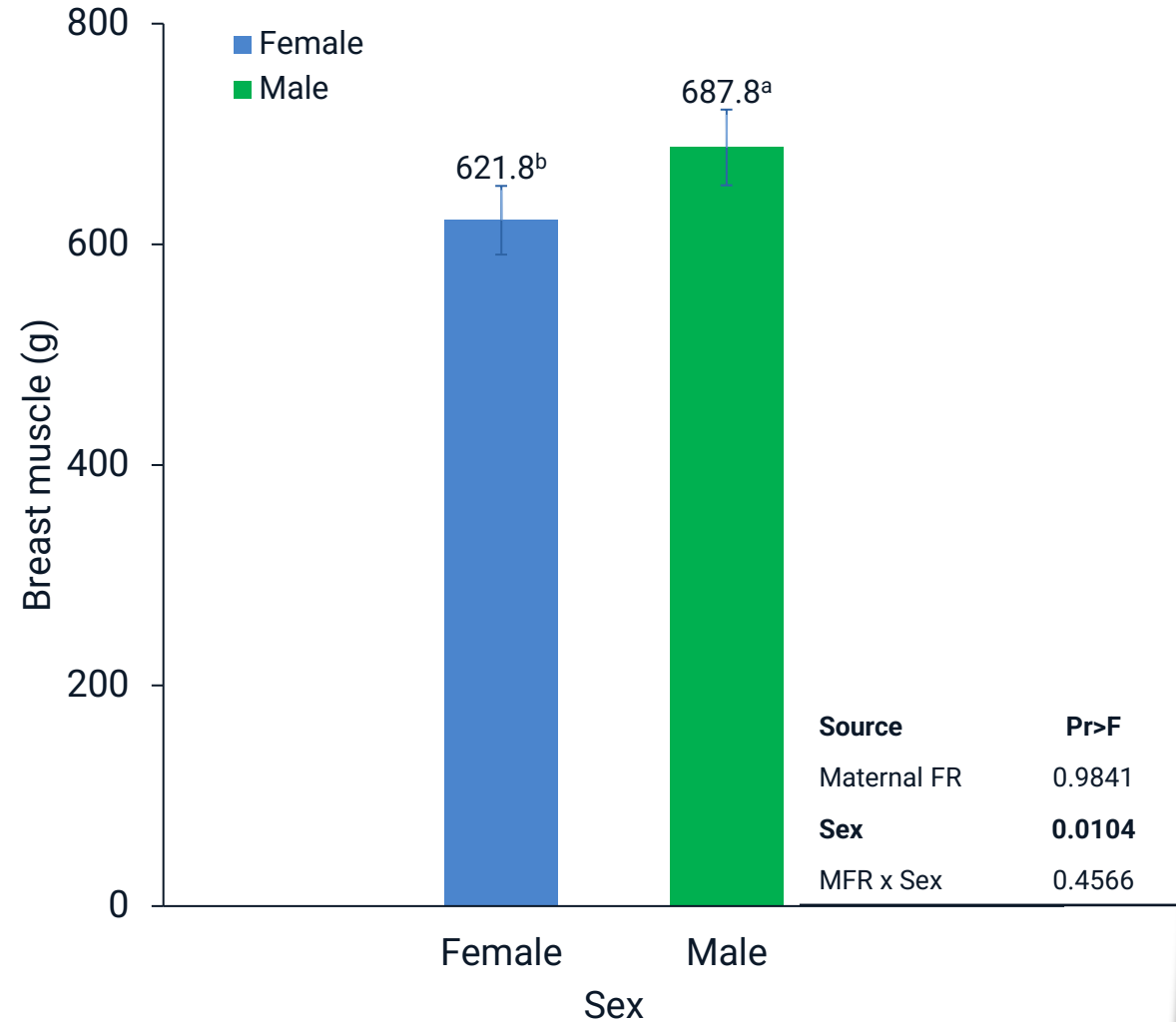


Breast muscle weight of broilers

Effect of maternal degree of feed restriction on broiler breast muscle

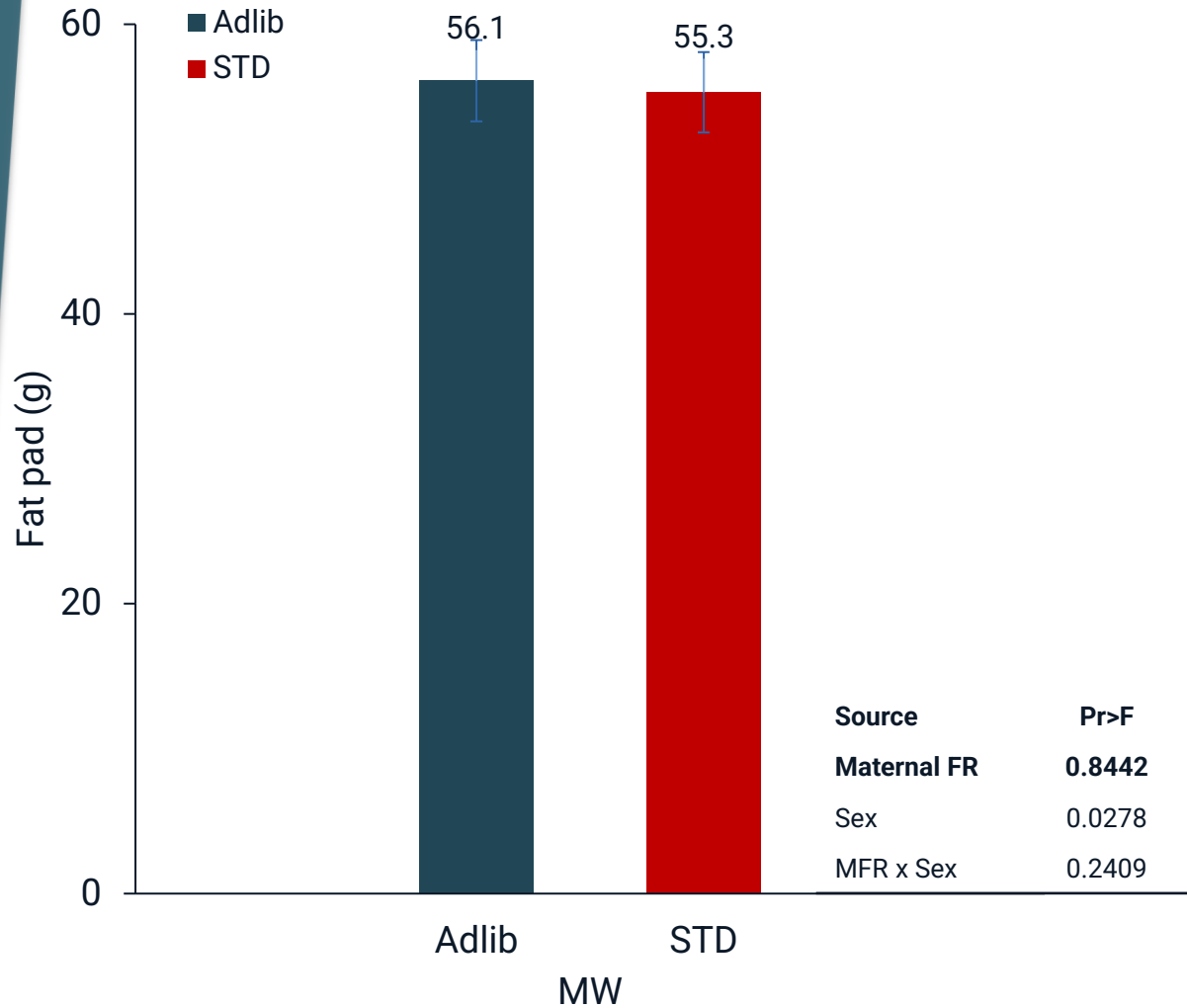


Effect of progeny sex on broiler breast muscle

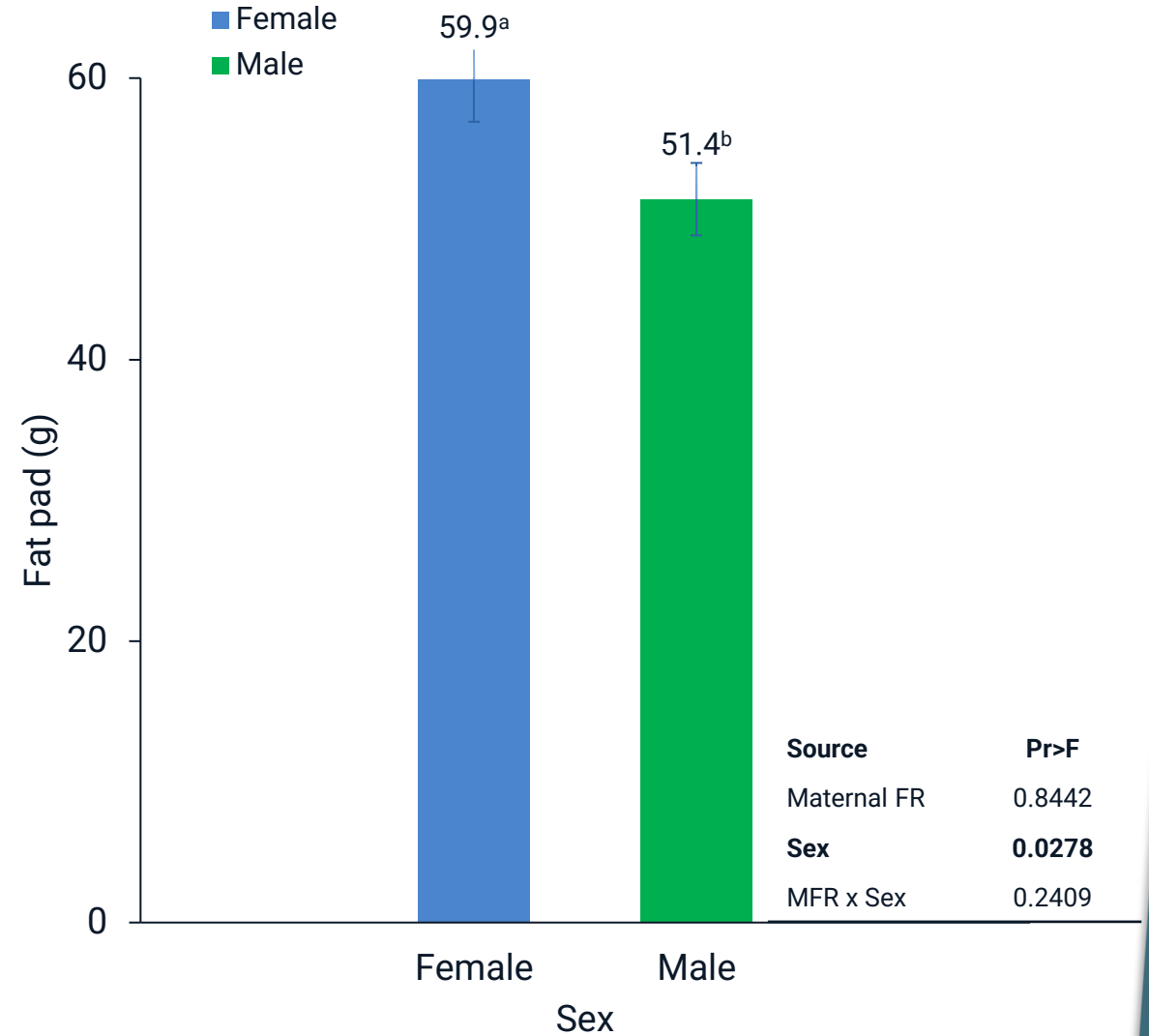


Fat pad weight of broilers

Effect of maternal degree of feed restriction on broiler fat pad



Effect of progeny sex on broiler fat pad



Summary

- At 32 weeks of maternal age, maternal degree of feed restriction of BB did not affect broiler BW, breast muscle and fat pad.
- There was a sex effect on broiler BW, breast muscle and fat pad.

However, will maternal age change the narrative (Zukiwsky et al., 2021)?

Thank you



<https://www.vecteezy.com/vector-art/5112792-cartoon-frightened-chicken-on-white-background>

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