

# The Effect of Formic Acid and Lignosulfonate on Pellet Quality.

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## Introduction

- Pelleting has been shown to improve weanling pig performance and reduce feed wastage.
- It is important to track pellet durability (PDI) to ensure whole pellets reach the pigs, pellets can be broken down by mechanical stressors in a feed mill, truck, or on farm.
- Acidifiers such as Formic Acid have been added to diets to help reduce the bacterial load, preserve feed quality and prevent mold growth.
- Concerns have arisen that Formic Acid may have a negative effect on pellet quality and thus may result in poorer performance.
- Lignosulfonate a by product of the paper-milling industry has been used for many years to increase pellet quality.

## Objective

- The objective of this study was to determine the effect of formic acid and liquid lignosulfonate, 50% DM, (LignoTech USA) on pellet quality.

## Experimental Procedures

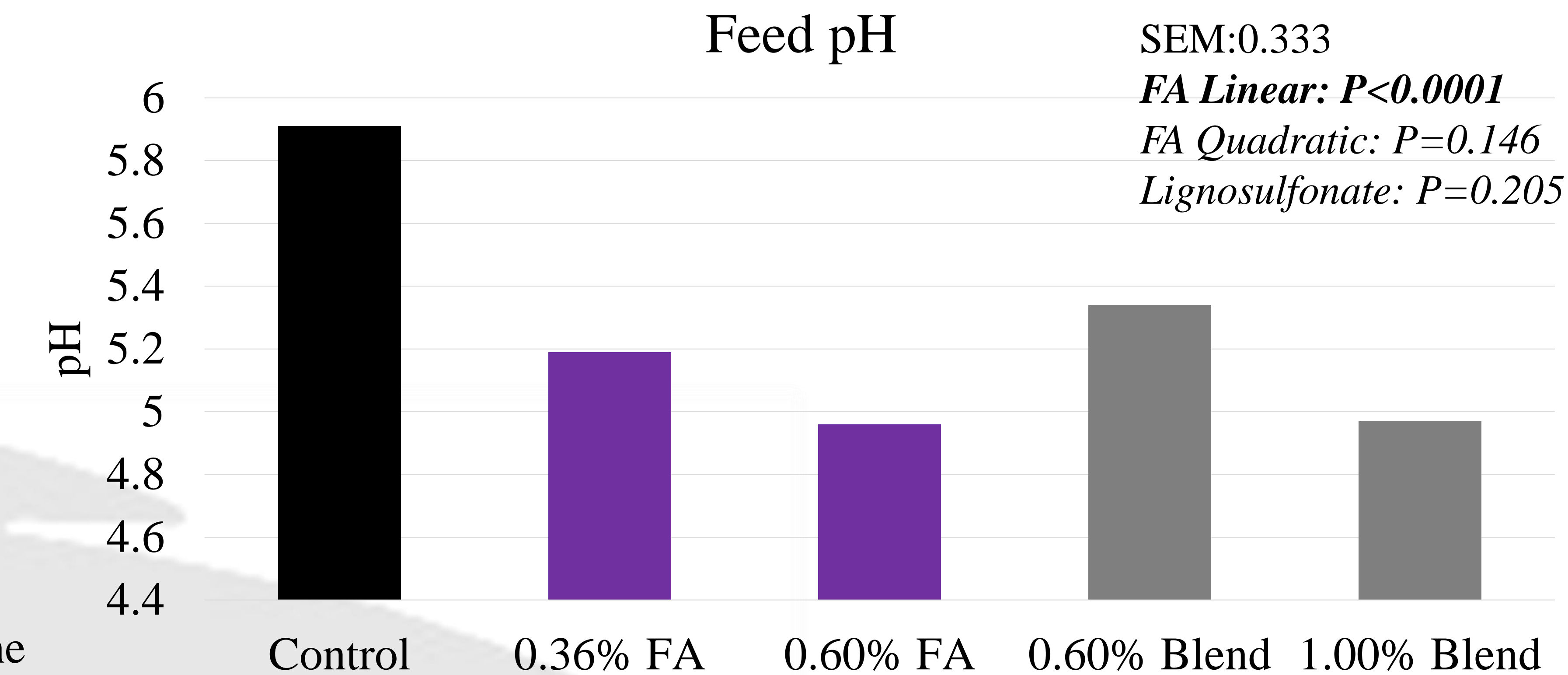
- Diets were manufactured at the Kansas State University O.H. Kruse Feed Technology and Innovation Center, Manhattan, KS.
- The 5 treatments consisted of a control, or the control with 2 levels of formic acid (0.36% and 0.60%), or the control with formic acid with lignosulfonate (Blend) (0.24% and 0.40%).
- Diets were pelleted at 3 separate time points to achieve 3 replications.
- Diets were steam conditioned in a Wenger pre-conditioner (Model 150)
- Retention time was set at 30 seconds with a production rate of 900 kg/hr.
- Diets were pelleted on a CPM(1012-2 HD Master Model) pellet mill with a 4.8 mm × 31.8 mm pellet die (L:D 6.7).
- Samples were collected from each treatment within rep and cooled in an experimental counterflow cooler.
- Conditioning temperature and hot pellet temperature were recorded for each sample.
- Energy consumption was recorded using a Supco DVCV Logger.
- Two samples from each replication were analyzed for PDI via Holmen NHP 100, standard tumble box, and modified tumble box methods.
- 25 pellets per rep were crushed perpendicular to their longitudinal axis via Texture Analyzer, the first peak force was recorded from each pellet and the average hardness was determined.

## Experimental Diets

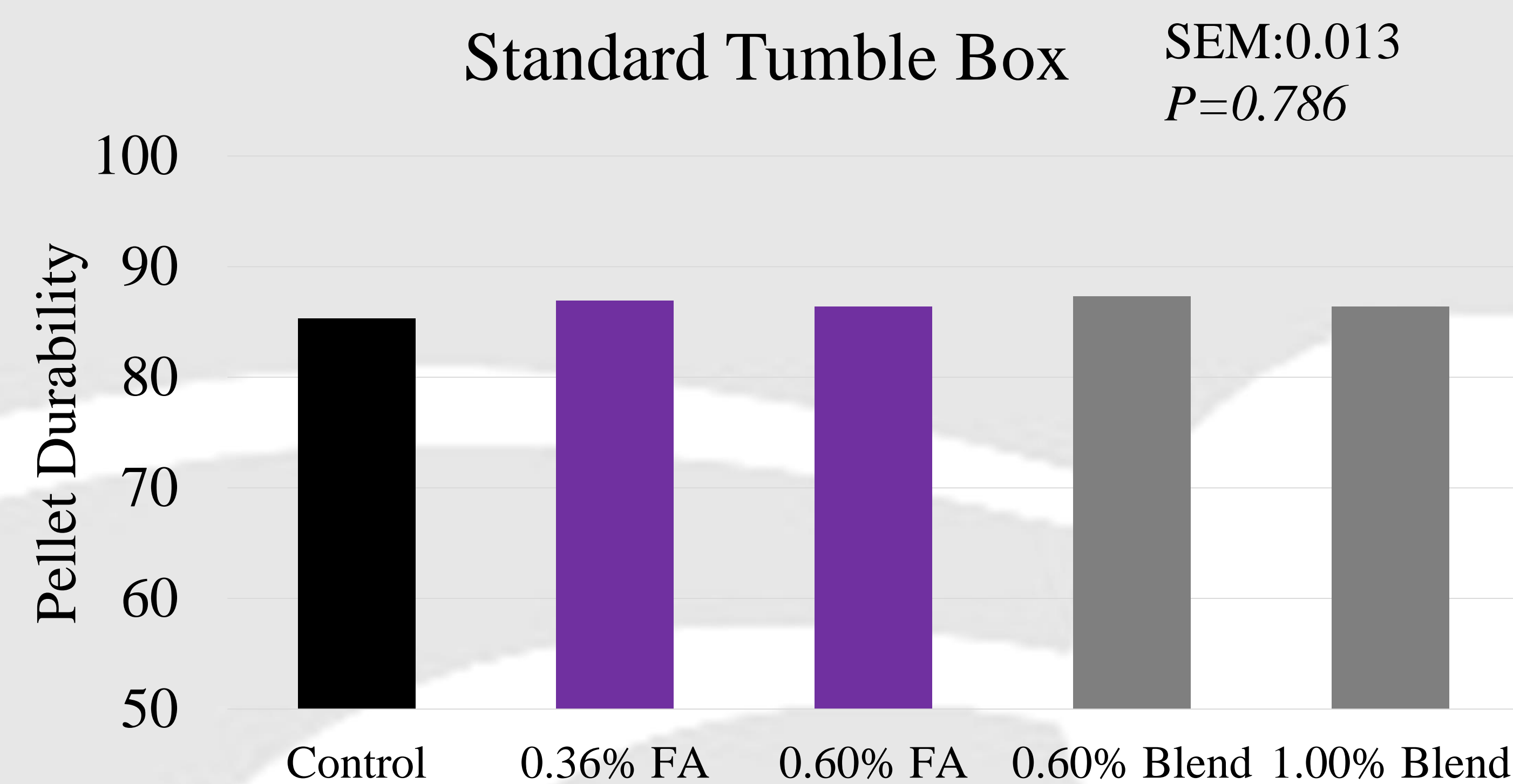
INGREDIENTS, %*	Control
Corn	1322
SBM 46.5%	565
Soy Oil	30
Crystalline Amino Acids	23.9
Mono Cal	22
Limestone	15
Salt	12
Vitamin & Mineral Premix	8.6
Total	2000.00

\*Formic Acid and lignosulfonate were added in the place of corn to achieve experimental treatments.

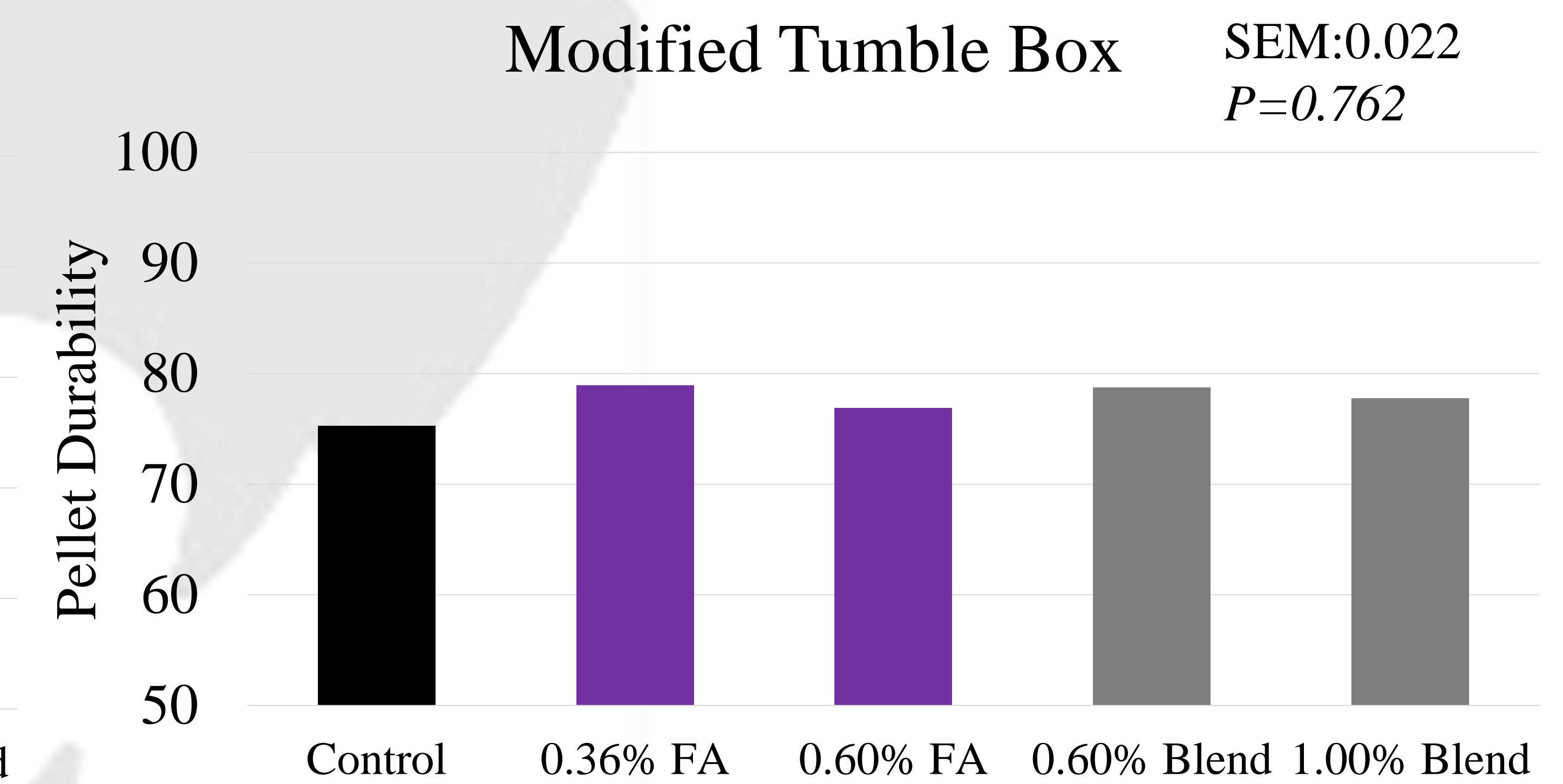
## Experimental Results



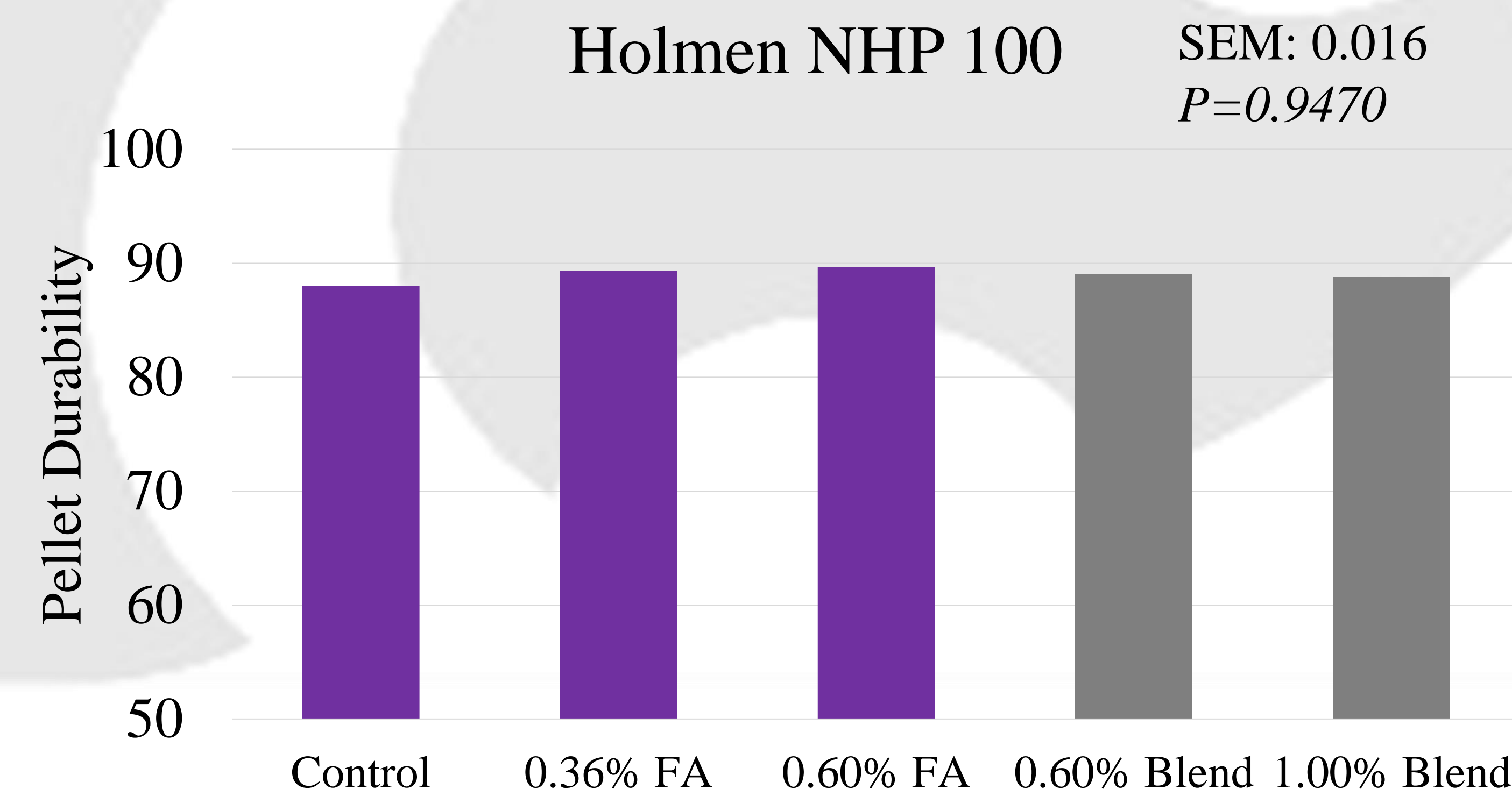
### Standard Tumble Box



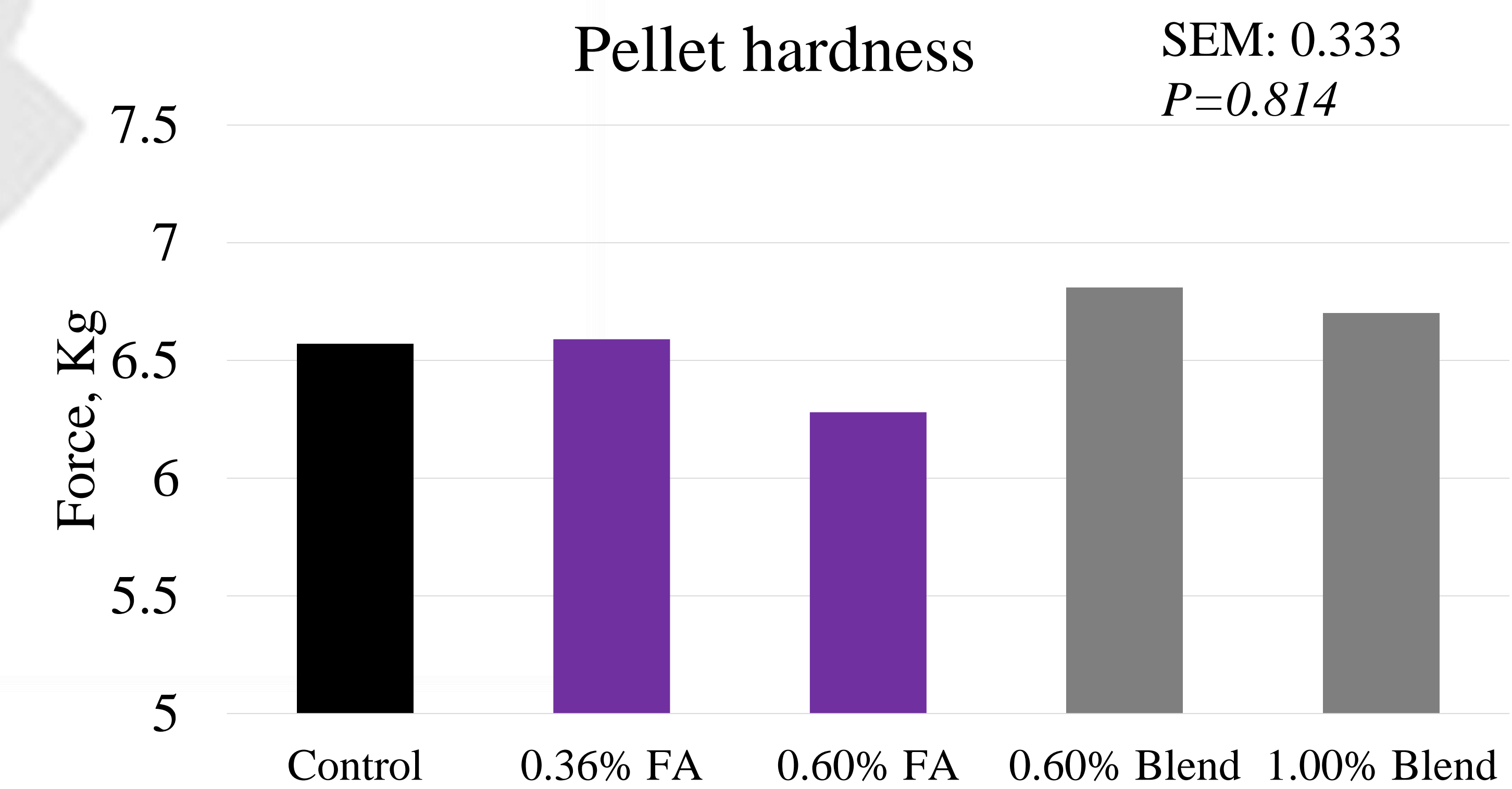
### Modified Tumble Box



### Holmen NHP 100



### Pellet hardness



## Conclusions

- There were no differences seen Conditioning Temperature or Hot Pellet Temperatures.
- There were no differences seen in Pellet Durability regardless of method ( $P > 0.10$ ), Pellet Hardness ( $P > 0.10$ ), Pellet Mill Energy Consumption ( $P > 0.10$ ).
- There was a linear decrease in pH ( $P < 0.0001$ ) as Formic acid levels increased from 0.36%-0.60%.