

# Effects of Whole-Grain Supplementation on Health, Growth, and Profitability of Pasture-Raised Lamb

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Results indicate a slight growth and body condition advantage for pasture-raised lambs with additional energy supplementation; however, the value of this additional gain would likely not have covered feed expenses

**Figure 1.** Pastures utilized for study (mixed pasture, rotationally grazed)



**Figure 2.** Lambs grazing and SUPP lambs receiving supplemental feed



**Figure 3.** Biweekly health assessment and weighing lambs



## Introduction

- There is increasing interest in raising livestock on pasture for many reasons, including consumer demand, added value products, economical advantages, and health and environmental benefits
- There is often a mismatch between the quantity and quality of available forage and the nutritional requirements of the animal
- Energy is often one of the most limiting nutrients for pastured livestock
- Supplemental feeding can provide additional nutrients that may be lacking in pasture but requires an economic advantage to be profitable

## Objective

To determine if supplemental energy from grain (whole barley) is able to improve the health, growth, and profitability of pasture-raised lambs

## Hypothesis

Providing supplemental energy from grain (whole barley) will increase overall dietary energy, resulting in improvements in the health, growth, and profitability of pasture-raised lambs

## Materials and Methods

- Similar groups of lambs were used in 2020 (n=79) and 2021 (n=99)
- Lambs were raised from mid-June through the end of September
- Two treatment groups: pasture (PAST) and supplemented (SUPP)
  - PAST: rotationally grazed 2 ha of high quality mixed pasture
  - SUPP: grazed similar pastures, fed whole barley at 0.45 kg/head/d
- Forage samples were collected weekly for forage yield and quality
- Lambs were weighed and assessed biweekly to determine bodyweight (BW), body condition score (BCS), and FAMACHA® score
- Individual fecal samples were collected at the start and end of each grazing year for fecal egg count (FEC) determination
- At the conclusion of grazing, lambs were scanned via ultrasound to determine carcass traits (backfat and loin area; 2020 only)
- Data was analyzed using mixed model analysis (significance  $P \leq 0.05$ )

## Results

### Health Parameters:

- Internal parasites were not a problem in 2020
  - Only 1 lamb with FAMACHA® score  $\geq 4$
  - Fecal egg counts started low and remained low throughout
- Internal parasites were more prevalent in 2021
  - Total of 17 lambs with FAMACHA® score  $\geq 4$
  - Higher fecal egg counts, but no difference between treatments
- Removed 4 PAST lambs and 2 SUPP lambs in 2020; 9 PAST and 5 SUPP in 2021

### Growth Parameters:

- No difference in 2020 but final BW was greater for SUPP lambs in 2021
- ADGs were variable but SUPP lambs had greater ADG than PAST lambs
- SUPP lambs ended with greater BCS than PAST lambs in both years
- Ultrasound scanning showed similar loin eye area across treatment groups
- Backfat thickness was greater for SUPP lambs compared to PAST lambs

### Profitability:

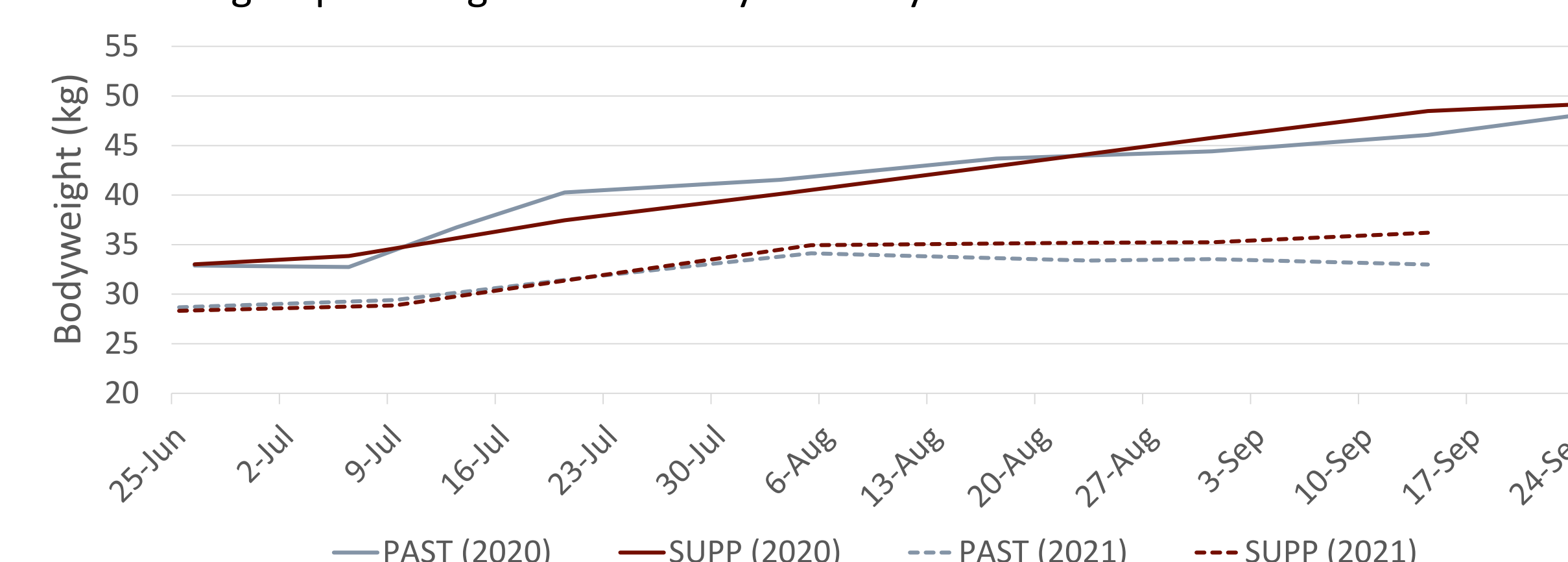
- Full economic analysis is still being completed
- Although SUPP lambs did have greater growth, the value of this additional gain would likely not have covered the cost of the supplemented feed

**Table 1.** Starting age, bodyweight (BW), FAMACHA® score, body condition score (BCS), and fecal egg count (FEC) for lambs in the pasture (PAST) and supplemented (SUPP) treatment groups at the start of each year

Year	Group	Number	Age (days)	BW (kg)	FAMACHA® Score (1-5)	BCS (1-5)	FEC (EPG)
2020	PAST	40	107	32.9	1.7	2.8	195
	SUPP	39	110	33.0	1.8	2.8	200
2021	PAST	50	89	28.5	2.1	2.7	99
	SUPP	49	87	28.1	2.2	2.6	126

Within column and year, means without a common superscript differ ( $P \leq 0.05$ )

**Figure 4.** Bodyweight for the lambs in the pasture (PAST) and supplemented (SUPP) treatment groups throughout the study in each year



**Table 2.** Ending bodyweight (BW), average daily gain (ADG), FAMACHA® score, body condition score (BCS), fecal egg count (FEC), backfat thickness, and loin eye area for lambs in the pasture (PAST) and supplemented (SUPP) treatment groups at the end of each year

Year	Group	Number	BW (kg)	ADG (kg/d)	FAMACHA® Score (1-5)	BCS (1-5)	FEC (EPG)	Backfat (mm)	Loin (mm)
2020	PAST	37	48.3	0.160 <sup>b</sup>	1.6 <sup>b</sup>	2.8 <sup>b</sup>	240 <sup>b</sup>	4.17 <sup>b</sup>	22.7
	SUPP	38	49.2	0.175 <sup>a</sup>	2.0 <sup>a</sup>	3.0 <sup>a</sup>	468 <sup>a</sup>	4.77 <sup>a</sup>	23.5
2021	PAST	41	33.0 <sup>b</sup>	0.054 <sup>b</sup>	2.7	2.3 <sup>b</sup>	2976	-	-
	SUPP	44	36.2 <sup>a</sup>	0.098 <sup>a</sup>	2.4	2.6 <sup>a</sup>	1731	-	-

Within column and year, means without a common superscript differ ( $P \leq 0.05$ )

**Figure 5.** Average daily gain for the lambs in the pasture (PAST) and supplemented (SUPP) treatment groups throughout the study in each year

