

# Productivity of lactating dairy cows fed diets with teff hay as the sole forage

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## INTRODUCTION

- Declining groundwater supplies is one of the most pressing issues facing the dairy industry today



- Alternative forage crops with improved water-efficiency have potential to improve the sustainability of the dairy industry in drought-stressed regions
- Teff is a warm-season annual grass (C4 physiology) native to Ethiopia that is well-adapted to arid conditions

## EXPERIMENTAL DESIGN

- Nine multiparous Holstein cows (185 ± 31 DIM) from the Kansas State University Dairy Cattle Teaching and Research Unit were used in a replicated 3 × 3 Latin square design
- Treatment periods were 18 d, with the final 4 d used for data and sample collection
- Treatment diets were TEFF-A, TEFF-B and CON (refer to Table 1)



**Table 2** Nutrient composition of teff hay used in experiment

Nutrients, % of DM	% of DM	Std. Dev.
DM, % as-fed	92.3	0.3
CP	12.9	0.4
aNDFom <sup>1</sup>	56.1	1.9
ADF	29.8	0.8
NFC	12.2	2.1
EE	1.9	0.1
Ash	8.0	0.3
uNDF <sup>2</sup>	12.4	5.5

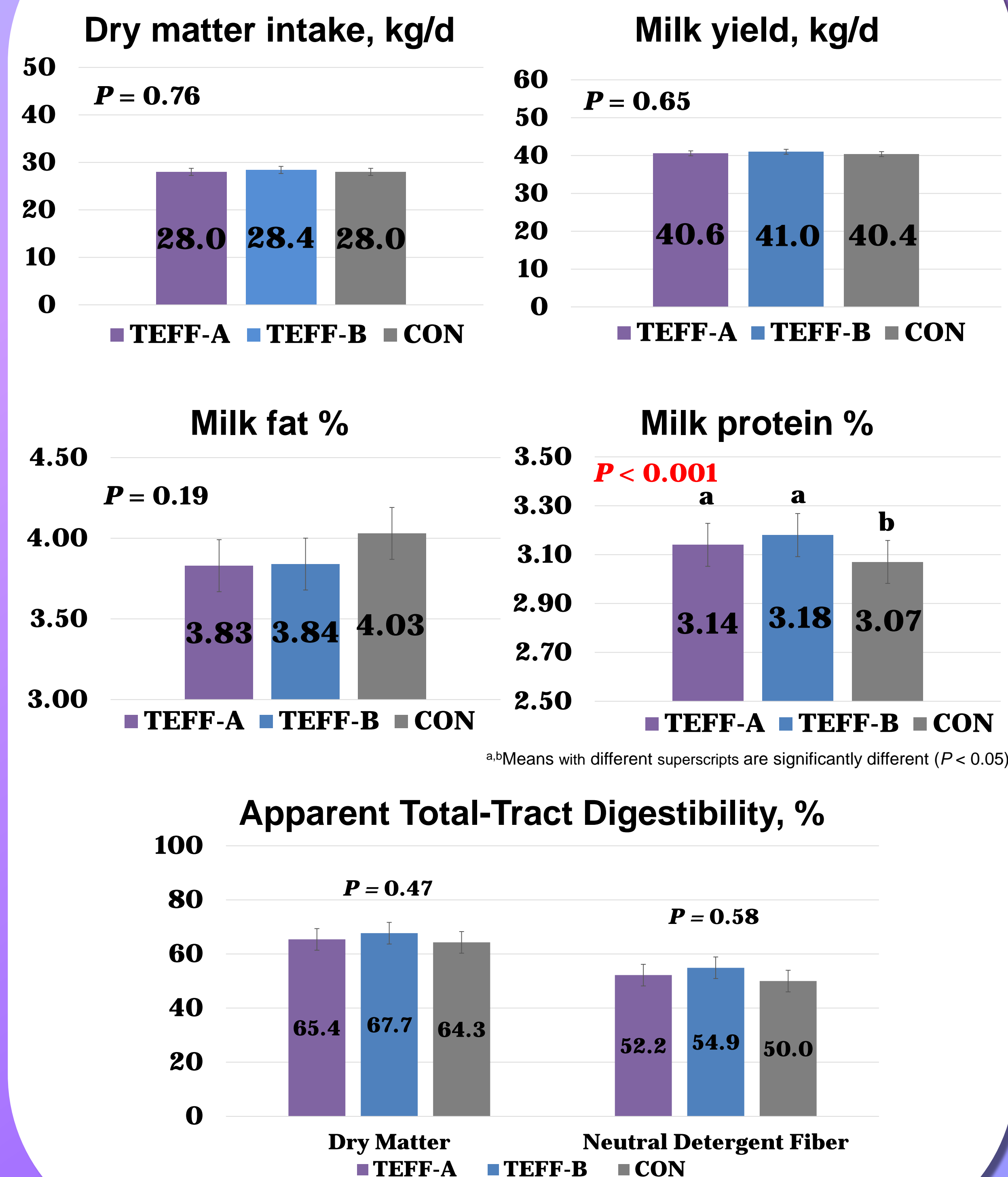
<sup>1</sup>Amylase-treated, ash-free neutral detergent fiber

<sup>2</sup>240 h undigested neutral detergent fiber

## OBJECTIVE

To assess the productivity of high producing dairy cows fed diets with teff hay as the sole forage

## RESULTS



## STUDY DIETS

**Table 1**

% of DM	TEFF – A	TEFF – B	CON
Teff hay	29.6	27.3	-
Corn silage	-	-	23.9
Alfalfa hay	-	-	19.4
Prairie hay	-	-	1.6
Wet corn gluten feed	23.2	23.2	23.2
TEFF grain mix	36.7	36.7	-
CON grain mix	-	-	27.9
Ground corn	7.0	7.1	-
Soybean hulls	-	2.2	-
Cottonseed	3.5	3.5	4.0
Water, % as-fed	26.2	26.2	-
Dry matter, % as-fed	60.0	60.0	59.6
Crude protein	17.1	17.1	16.8
Neutral detergent fiber	33.6	33.6	31.7
Forage NDF	18.1	16.6	18.3
Acid detergent fiber	16.7	17.0	18.6
Non-fiber carbohydrate	35.3	35.5	36.7
Ether extract	3.7	3.7	4.1
Ash	8.8	8.7	9.1
uNDF <sub>240</sub>	5.8	5.5	9.0

## CONCLUSIONS

- Teff grass has potential to be used as an alternative forage source for lactating dairy cows without negatively impacting DMI or milk and component production
- A high-NDF forage like teff can be incorporated into the diet at a lower inclusion rate and, by filling space with additional concentrate, diet fermentability and rumen stability can be maintained
- Feeding teff has potential to improve the resilience of the dairy industry to future water shortages

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