

Dietary Inclusion of Whole Crop Faba Bean Silage in Dairy Cattle

-Performance Results-

9th Annual Dairy Info Day

Víctor Guevara, Dave Christensen, and Peiqiang Yu

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SK Ministry of Agriculture Strategic Research Chair: Feeds

SK Ministry of Agriculture Strategic Research Chair: Feeds R&D

Peiqiang Yu, Ph.D.

Professor & Ministry of Agriculture Strategic Research Chair

Feed Research and Development Program

Department of Animal and Poultry Science,
College of Agriculture and Bioresources,
University of Saskatchewan, Saskatoon, Canada.

Tel: + 1 306 966 4132; Fax: + 1 306 966 4151

E-mail: peiqiang.yu@usask.ca

<http://agbio.usask.ca/find-people/Yu-Peiqiang.php>



I. Literature Review

- Faba bean (*Vicia faba* L.), originated in the **Mediterranean region** (north Africa) or **southwestern Asia** (Singh and Bhatt, 2012).
- Capable of growing in **cool** and **wet environments** (Tanno and Willcox, 2006).
- Recognized due to the **ecological properties (N fixation)**.
- There are two types of faba bean:
 - **Tannin** - Human consumption
 - **Low Tannin** - Human and Animal consumption
- The production of **Faba bean** increased almost **200%**.



(Fleurly and Barker, 2016)

I. Literature Review

Silage

- Silage on a dairy farm would consist of **barley, corn or alfalfa**.
- **Mycotoxin** is a **problem** for cereal grain and cereal silage in **western Canada** and seems that this issue is increasing (McKinnon, 2014).
- **Limited data** from previous studies demonstrated that whole plant **faba bean silage** is comparable to grass-legume silage (Ingalls et al., 1974).



I. Literature Review

Silage

- Faba bean silage was **higher in protein** and **lower in crude fibre**, ether extract and ash than grass-legume silage (McKnight and MacLeod, 1977).
- **Soluble protein fraction** was highest for pea silage, intermediate for soybean silage, and **lowest for faba bean silage**.
- The **effective ruminal degradability of CP** for the three silages was high, and higher for soybean silage and pea silage than for faba bean silage.

(Mustafa and Seguin, 2003)

- In this case, **faba bean forage can be used as excellent alternative** feed to be used in Western Canadian Farms.

I. Literature Review

Silage

- **Faba bean silage at late pod stage (97 days)** provide:
 - Highest DM yield (12 tonnes DM / hectare or 4.8 tonnes DM / acre)
 - 22 % of crude protein and 17 % of starch
 - Highest NE_L
 - Highest Bypass Protein (RUP)
 - Highest Predicted Production Performance (FMV) (1.48 kg of milk / kg of silage)

	FMV (kg milk/kg feed)
Barley Silage	1.06
Barley Grain	1.36
Faba Silage	1.48
Canola Meal	2.36

II. Objectives

- To carry out **dairy production performance** and **metabolic trials** with faba silage to develop an efficient feeding strategy of faba silage.
- To **increase basic knowledge** of the nutritional relevance of faba forage hay and silage and apply this info to the production of high-quality feeding programs.

III. Research Results

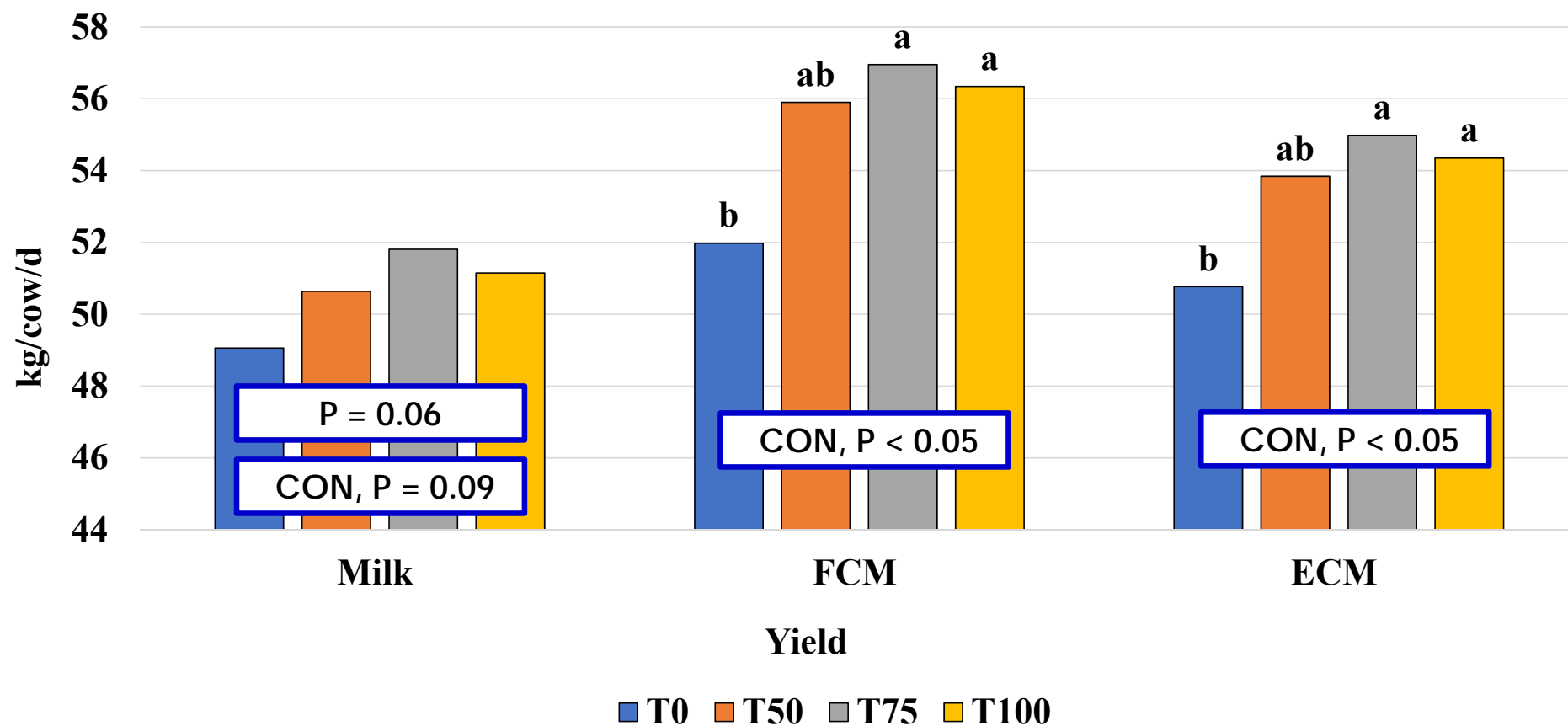
DAIRY PERFORMANCE AND METABOLIC TRIALS WITH WHOLE CROP FABA SILAGE



Study I: Dairy Performance with Whole Crop Faba Silage to Replace Barley or Corn Silage

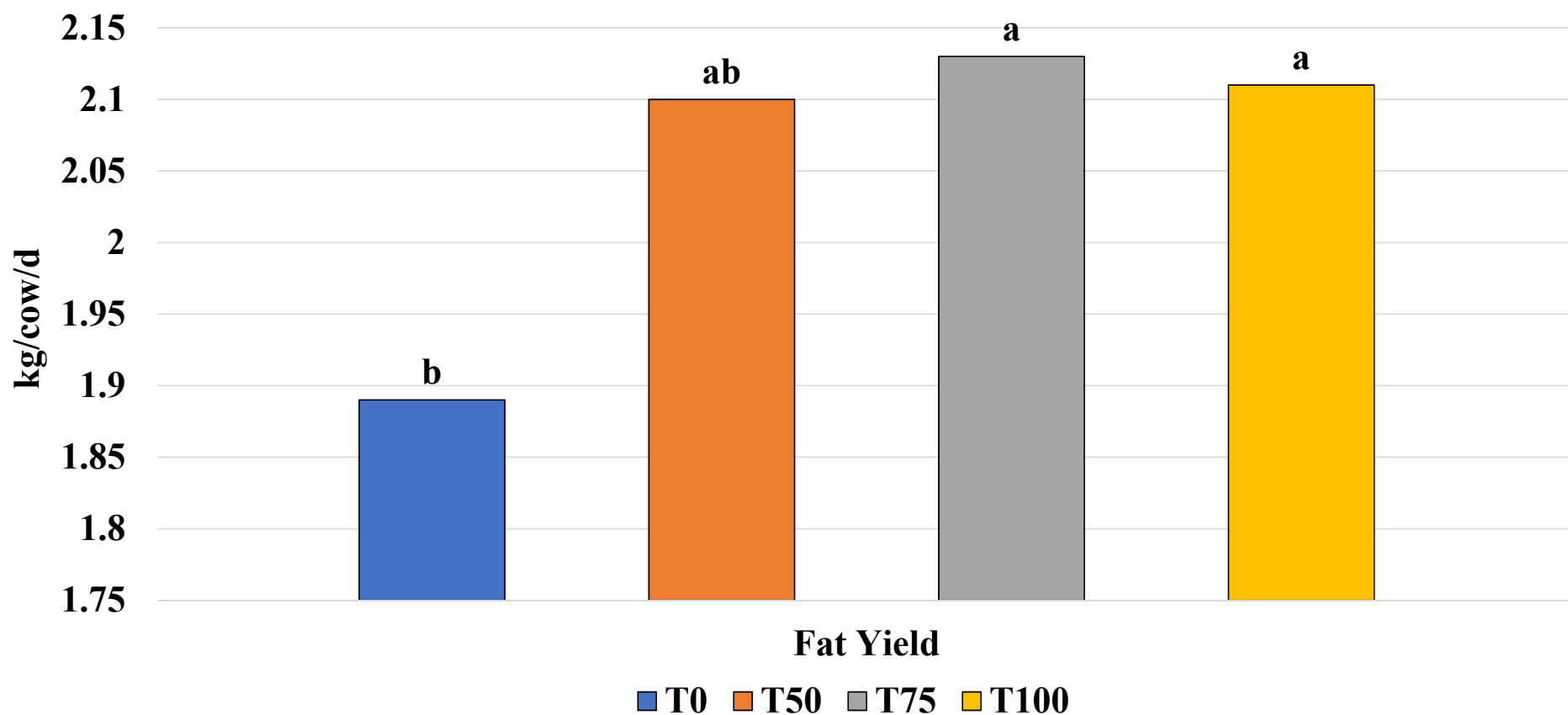
Item	Treatment % (T)			
	0	50	75	100
Ingredient, % of DM				
Corn Silage	18.37	9.18	4.59	0
Barley Silage	12.23	6.12	3.06	0
Faba Silage	0	15.3	22.95	30.6
Alfalfa Hay	10.41	10.41	10.41	10.41
Straw	4.09	4.09	4.09	4.09
Beet Pulp	7.81	7.81	7.81	7.81
RP10 palmitic	1.52	1.52	1.52	1.52
Barley/Corn	27.7	31.05	32.17	32.91
Protein	13.39	10.04	8.92	8.18
Lactating Supplement	4.46	4.46	4.46	4.46

Study I: Dairy Performance with Whole Crop Faba Silage to Replace Barley or Corn Silage

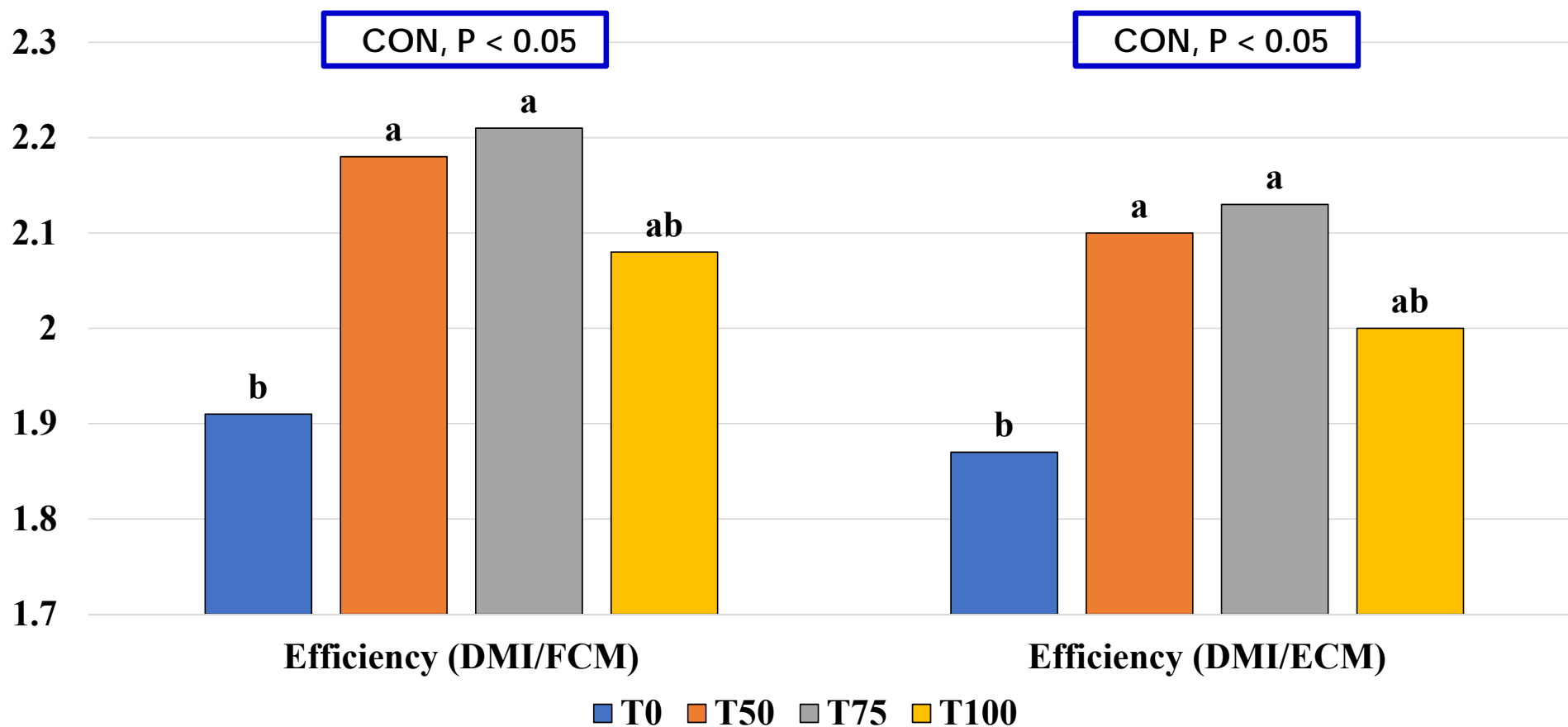


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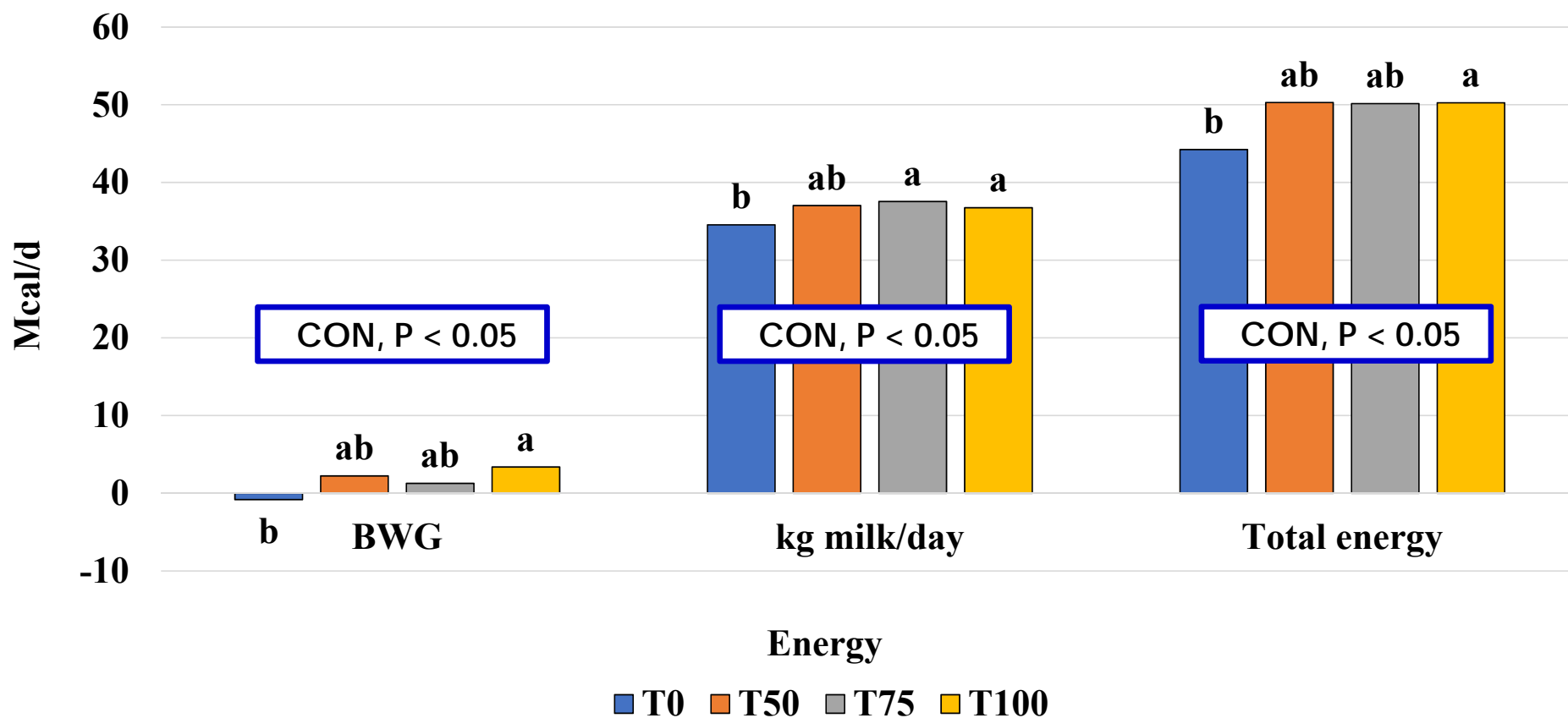
CON, P < 0.05



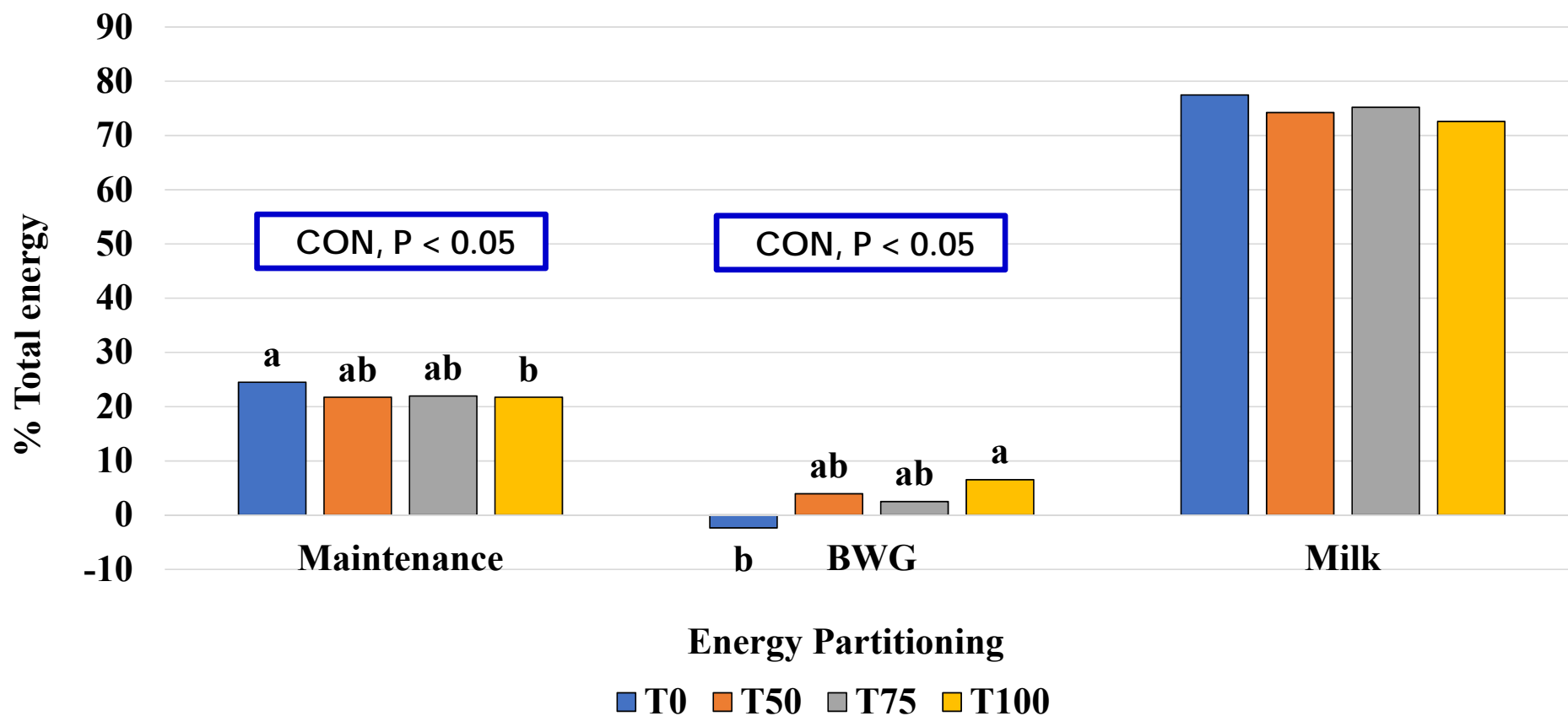
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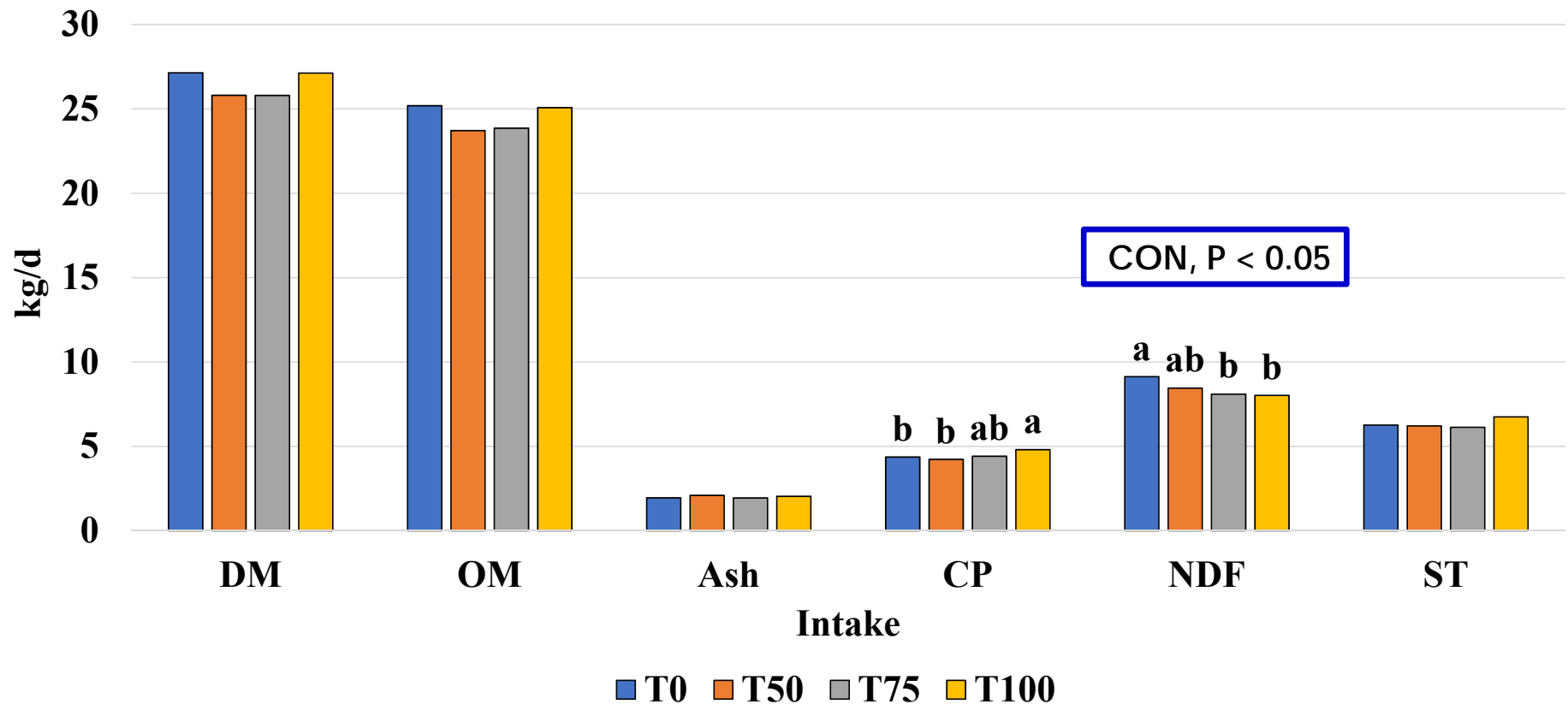


Study I: Dairy Performance with Whole Crop Faba Silage to Replace Barley or Corn Silage



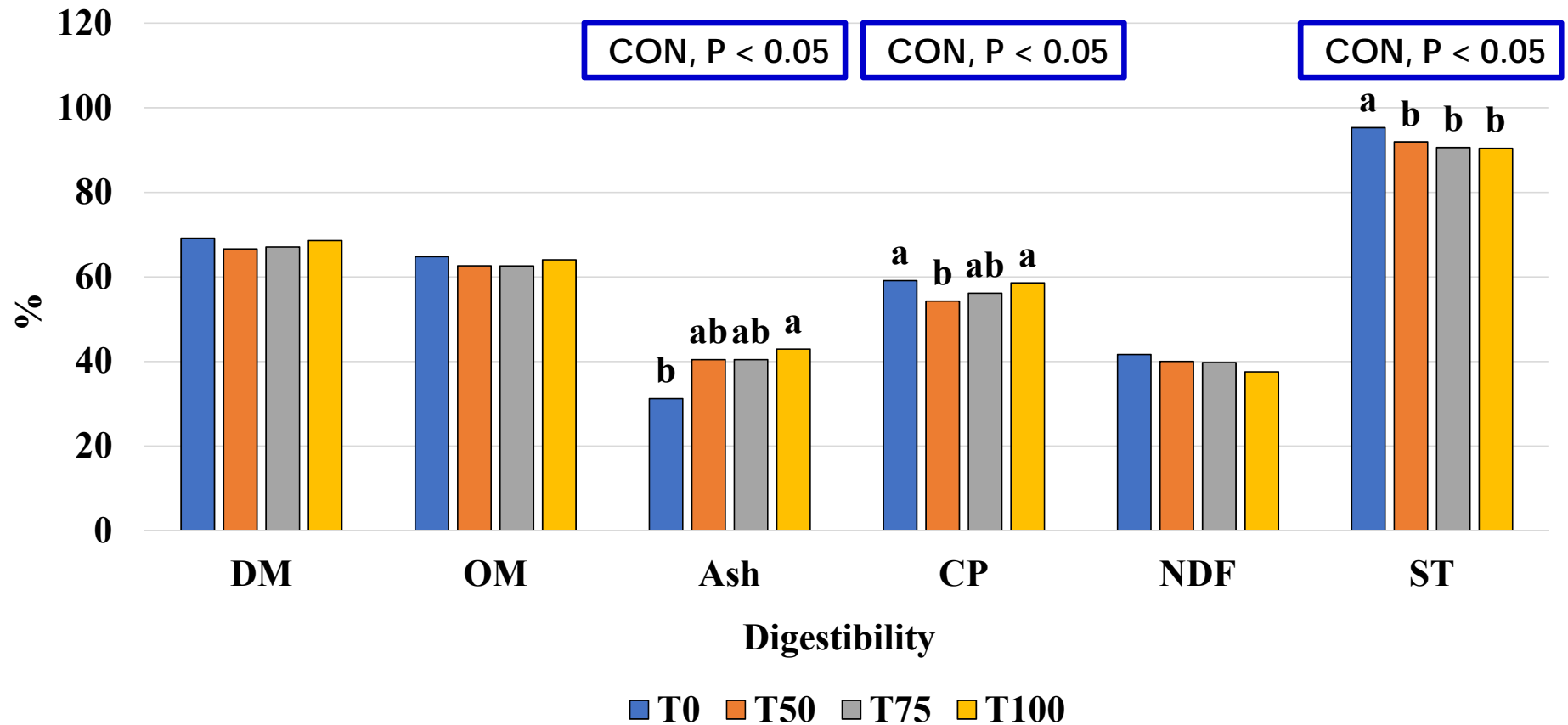
Study II: Metabolic Study

Primary Nutrient Digestion/Nutrient Flow/Metabolic Study



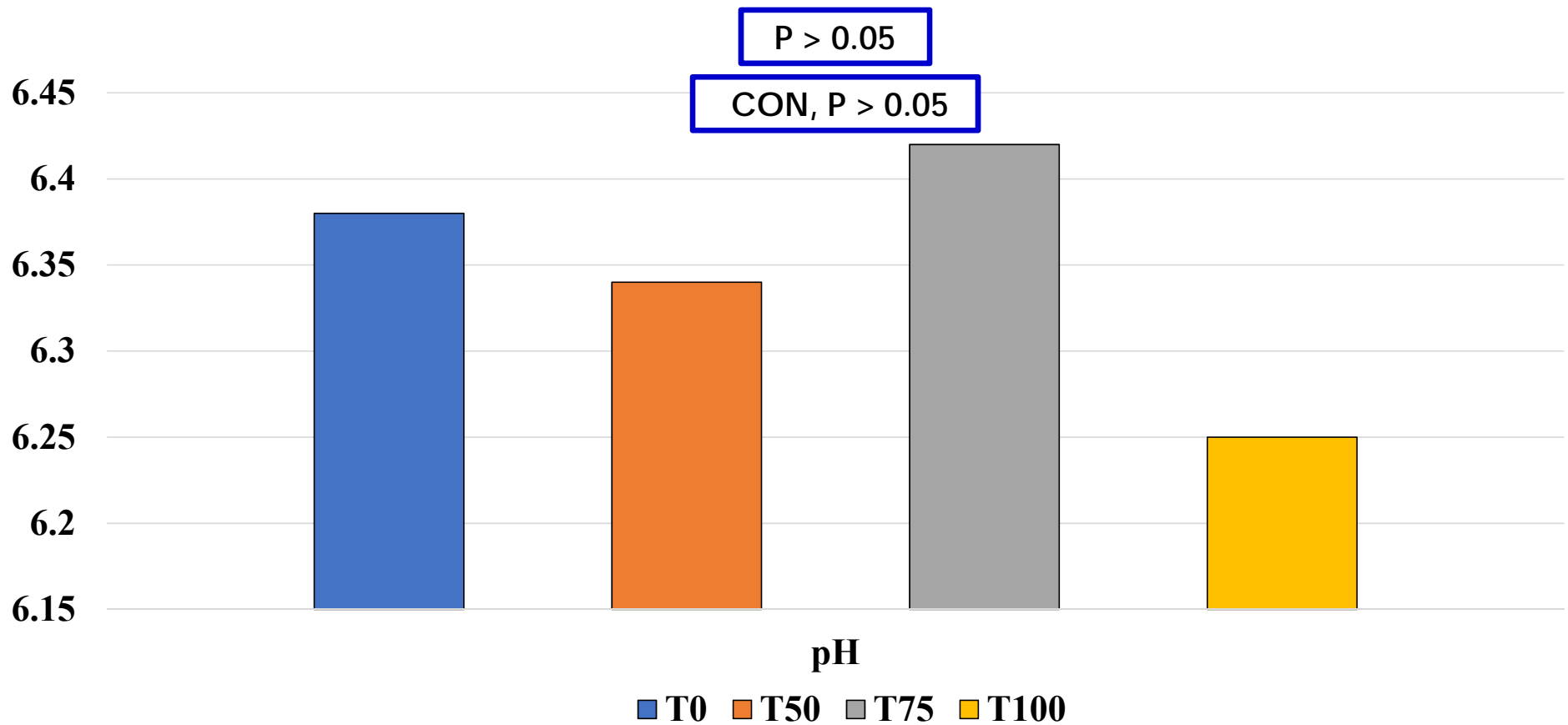
Study II: Metabolic Study

Primary Nutrient Digestion/Nutrient Flow/Metabolic Study



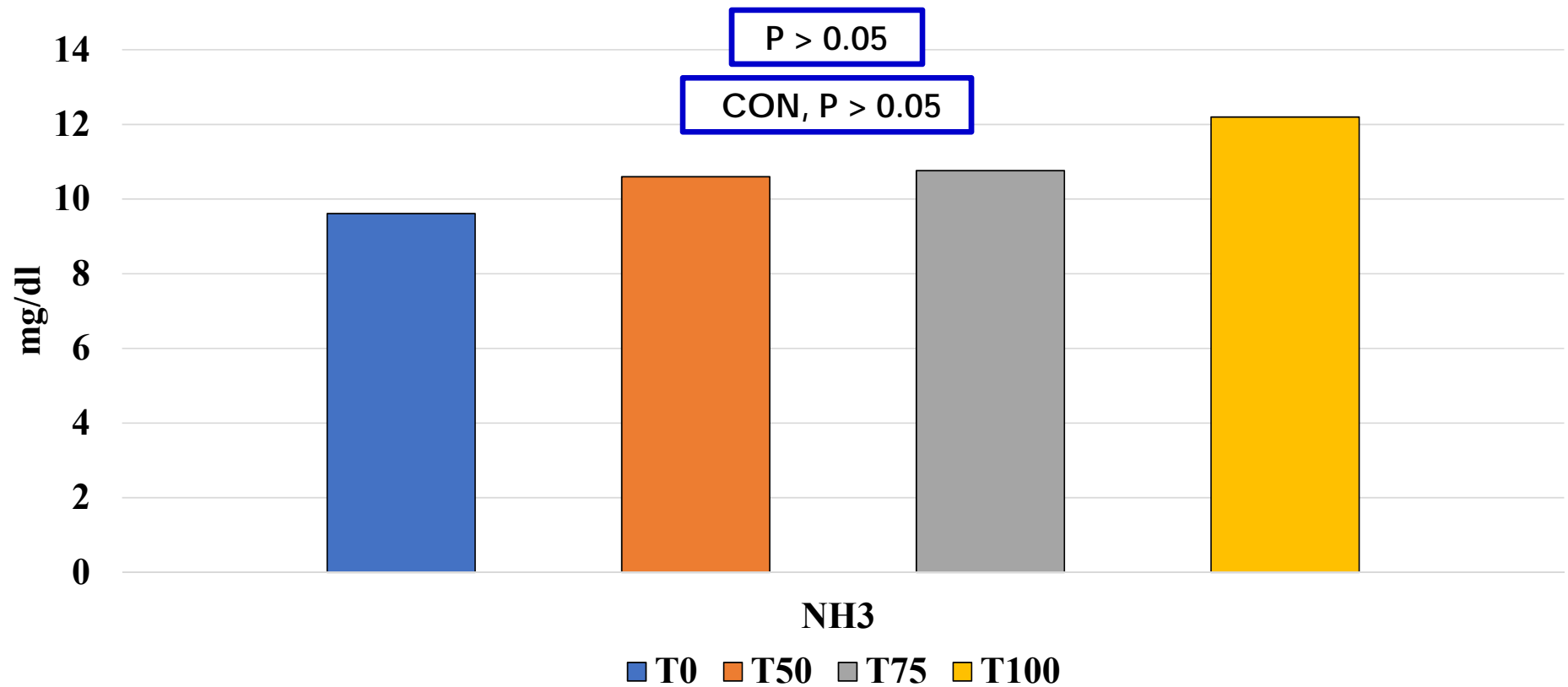
Study II: Metabolic Study

Primary Nutrient Digestion/Nutrient Flow/Metabolic Study



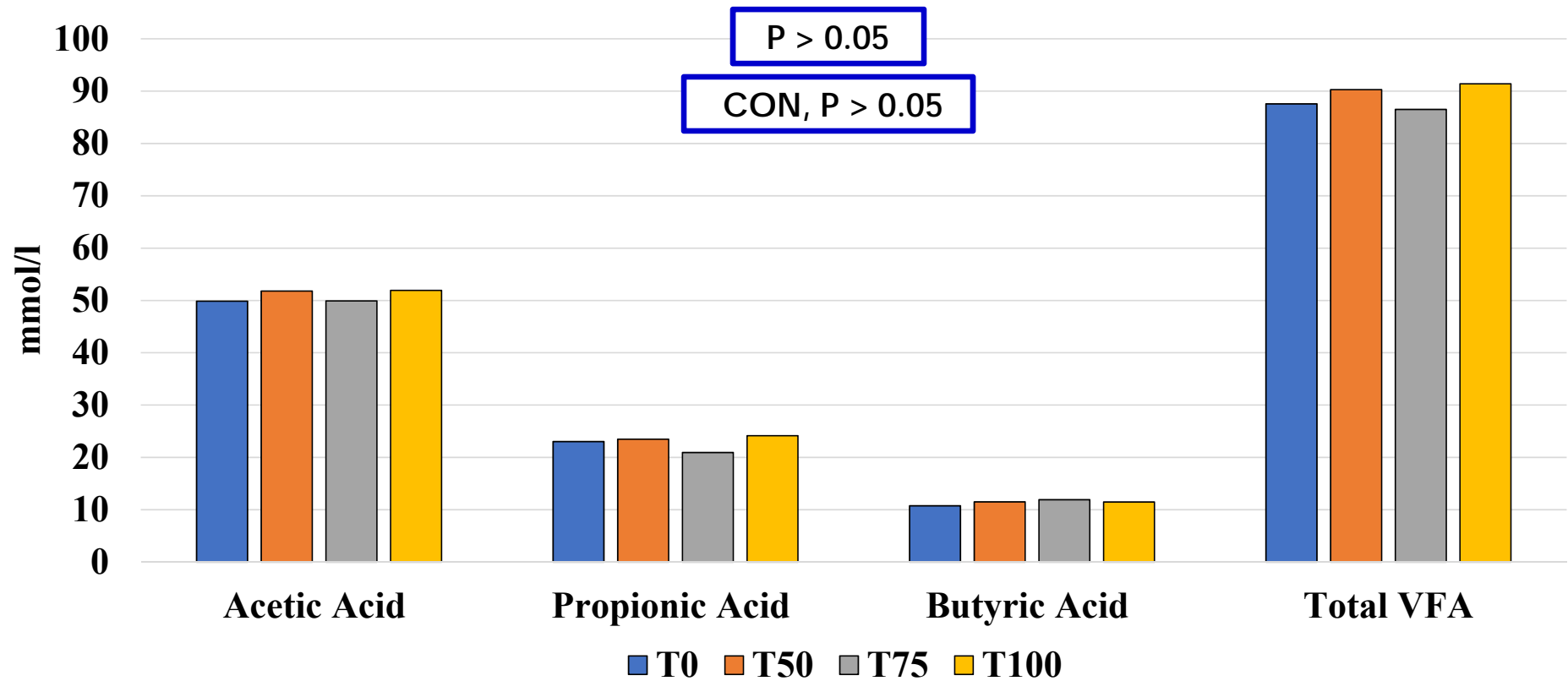
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Primary Nutrient Digestion/Nutrient Flow/Metabolic Study



Study II: Metabolic Study

Primary Nutrient Digestion/Nutrient Flow/Metabolic Study



VI. Conclusions

- Inclusion of faba bean silage **did not negatively affect the intake.**
- In early lactating dairy cows
 - **Feed efficiency is improved.**
 - **Fat corrected milk and energy corrected milk are increased.**
 - **Fat yield is improved.**
- Inclusion of faba bean silage did not negatively affect the rumen fermentation parameters.
- Whole crop faba bean silage at late pod stage is a **high-quality feed.**
- It can be used as a **high value ingredient for dairy cows.**

Acknowledgements

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THANK YOU VERY MUCH !!

