Effect of Feeding Graded Levels of Moringa Feed on Intake, Digestibility, Enteric CH_4 Emission, Rumen Fermentation, Milk Yield and its Quality of BLRI Cattle Breed-1 Dairy Cows

Muhammad Khairul Bashar[1], Nathu Ram Sarker[2]

[1,2] *Bangladesh Livestock Research Institute (BLRI), Savar, Dhaka-1341, Bangladesh*

Introduction

SCIENCE & RESEARCH agree that

- Moringa feed quantitatively increase milk & meat production by 30 to 40% *(Matloup et al., 2017, Kholif et al., 2015 and Mohamed S. Khalel et al.,2014)*
- Quality of milk, meat & eggs increases *(Sarwatt et al.,2004, Mendieta-Aracia 2011, Basitan and Emma 2013)*
- Support animal health *(Iqbal and Bhanger 2006; Pourmorad et al., 2006, Khalafalla et al., 2010 and Satish et al., 2013)*
- **Research objective**: What is the moringa feed quality and feeding impact on nutrient utilization, fermentation, methane (CH4) emission and milk yield

Experimental design

Parameters	Experimental diet		
	T_o	T_1	T_2
No. of cows	5	5	5
Exp. period	60 days		
Parity	3^{rd} or 4^{th}		
Napier silage (%)	50	50	50
C:M	100:0	50:50	0:100
Housing	*Individual*	*Individual*	*Individual*
Water	*ad libitum*	*ad libitum*	*ad libitum*

C; concentrate mixture, M; moringa feed

T_0, Control (only concentrate); T_1, 50% concentrate+ 50% moringa feed; T_2, only moringa feed

Feed ingredients of different treatments (% fresh)

Ingredients	T_0	T_1	T_2
Wheat bran	40	20	0
Rice bran	25	12.5	0
Soybean meal	15	7.5	0
Moringa feed	0	40	80
Crusted wheat	16	16	16
Vitamin mineral premix	3	3	3
Salt	1	1	1
Total	100	100	100

Results

- Supplementation of moringa feed to the concentrate mixture did not have any adverse effect on CH4 production
- Partial or complete exchange of balance concentrate mixture by the moringa feed enhanced the % of dietary N- utilization by nearly 60.0 in only moringa group in comparison to control
- No effect was observed for blood sugar (BS), total protein (TP), albumin, globulin, aspartate aminotransferase (AST) and alanine aminotransferase (ALT) and creatinine of dairy cows among different treatments group

Fig.1: Moringa feed production procedure

Highlights

- **Feeding moringa feed increased 31% of total milk production and at the same time reduced 50% cholesterol level in milk from control**
- **Replacing the whole concentrate diet**

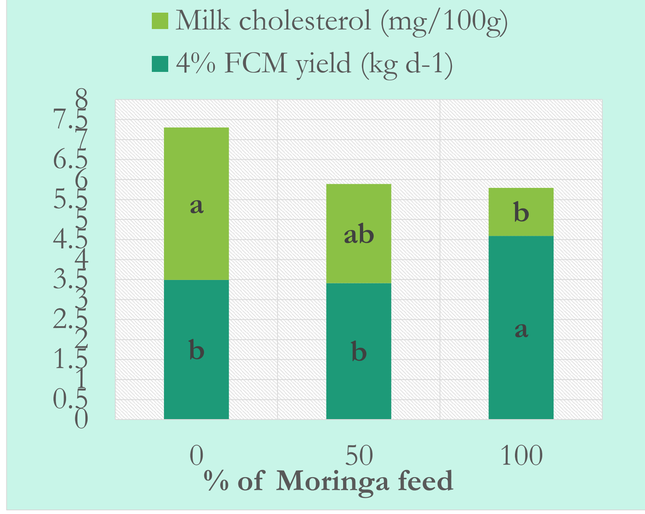

Fig 2. Moringa feed feeding impact on fat corrected milk (FCM) yield and milk cholesterol

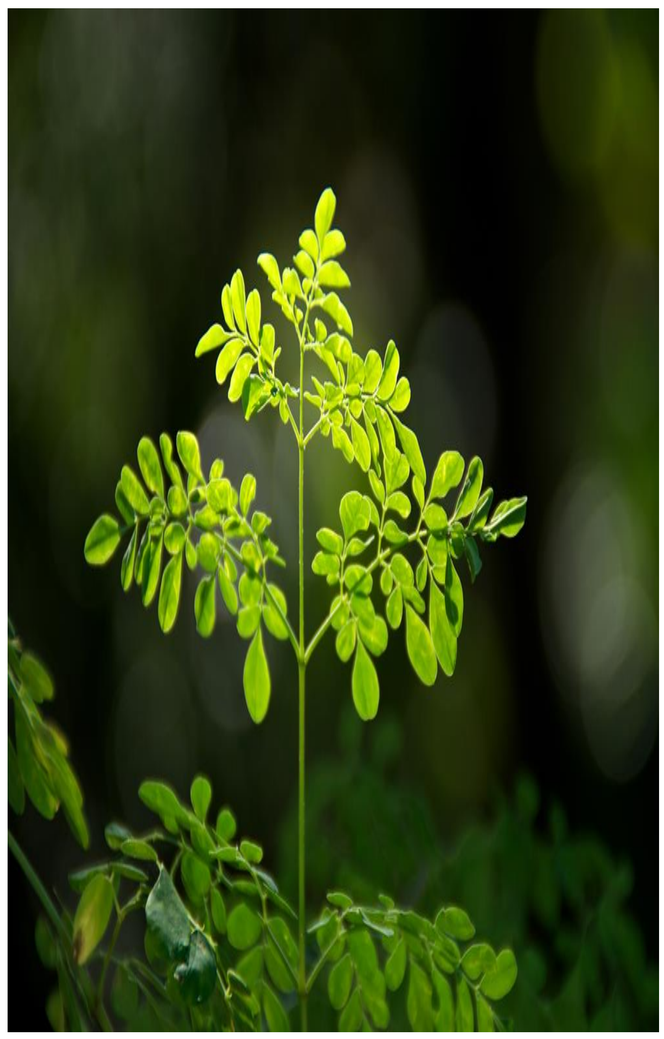

Fig 4. Moringa foliage in the research field

Materials and Methods

- Time and place; April 2017, Cattle research station of BLRI, Bangladesh

Chemical composition of feedstuffs

Items	Chemical composition (g/kg)		
	Napier silage	Concentrate mix.	Moringa feed
Fresh basis (g/kg)			
DM	182	884	888
DM basis (g/kg)			
OM	915	898	901
CP	83	165	166
NDF	671	510	407
ADF	455	208	328
Energy (MJ/kg DM)			
GE	-	10.03	10.01

DM, dry matter; OM, organic matter; CP, crude protein; NDF; neutral detergent fiber; ADF, acid detergent fiber; GE, gross energy.

Results

- Only moringa feeding group reduced 14.8% DM intake per 100 kg body weight and also increased 25.3% feed efficiency with control.
- In addition, CP consumption was also lowest (12.6 g/kg $W^{0.75}$) associated with T_0 group (14.1 g/kg $W^{0.75}$)
- Supplementing moringa feed to the control diet, only moringa group produced the highest amount of milk (4.59 kg/day) whereas the lowest production of milk was observed at only concentrate group (3.49 kg/day) (Fig.1)
- With the increased of moringa feed into the concentrate diet, the milk cholesterol decreased gradually from 3.18 to 1.2 mg/100gm milk (Fig.1).
- Compared with control the concentration of NH3-N and concentration of volatile fatty acid (VFA) was negatively correlated that indicated to increase the utilization of dietary N (Fig.3)

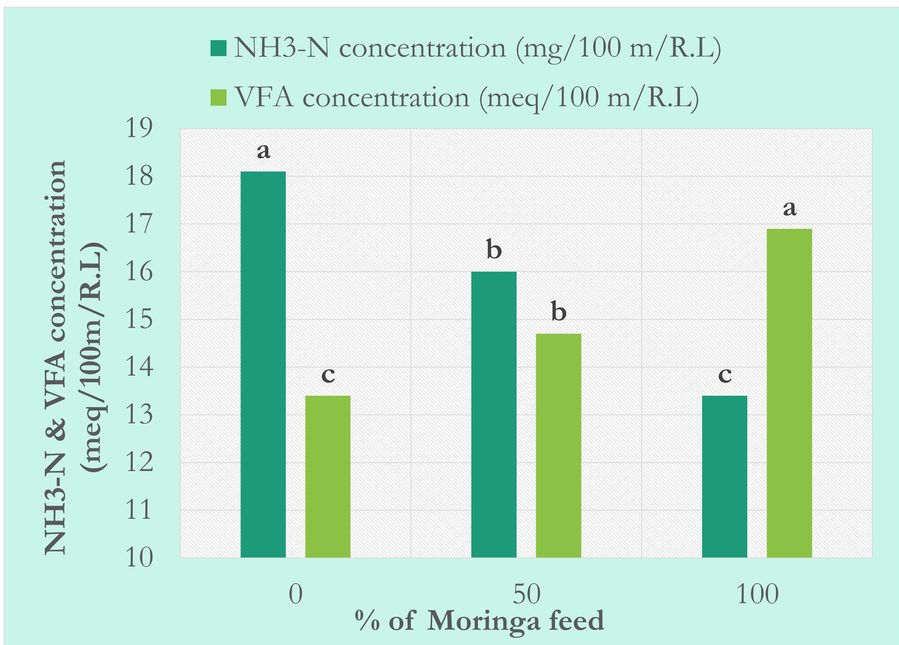

Fig 3. Moringa feed feeding impact on NH3-N and VFA concentration

ACKNOWLEDGEMENTS

The research work was funded by "**Fodder Research and Development Project**," Ministry of Fisheries and Livestock, Government of Bangladesh and Bangladesh Livestock Research Institute (BLRI), Savar, Dhaka-1341.