EFFECT OF SUPPLEMENTATION OF CONCENTRATE TO SWEET SORGHUM BAGASSE WITH LEAF RESIDUE SILAGE ON NUTRIENT UTILIZATION AND NITROGEN BALANCE IN NATIVE SHEEP

DR.B.VIDYA
ASSISTANT PROFESSOR
DEPARTMRNT OF ANIMAL NUTRITION
CVSC, KORUTLA

INTRODUCTION

- INDIA- Sheep and Goat play a vital role in rural economy
- Sheep - 75 million (FAOSTAT ,2012)
- Goat - 160 million
- In India during the year 2011, total meat production from sheep and goat was 2,93,000 and 8,46,600 tonnes, respectively (FAOSTAT, 2013).

Contd..

Major constraints:

- Shortage of feed and fodder

Feed and Fodder Availability and Requirement in India

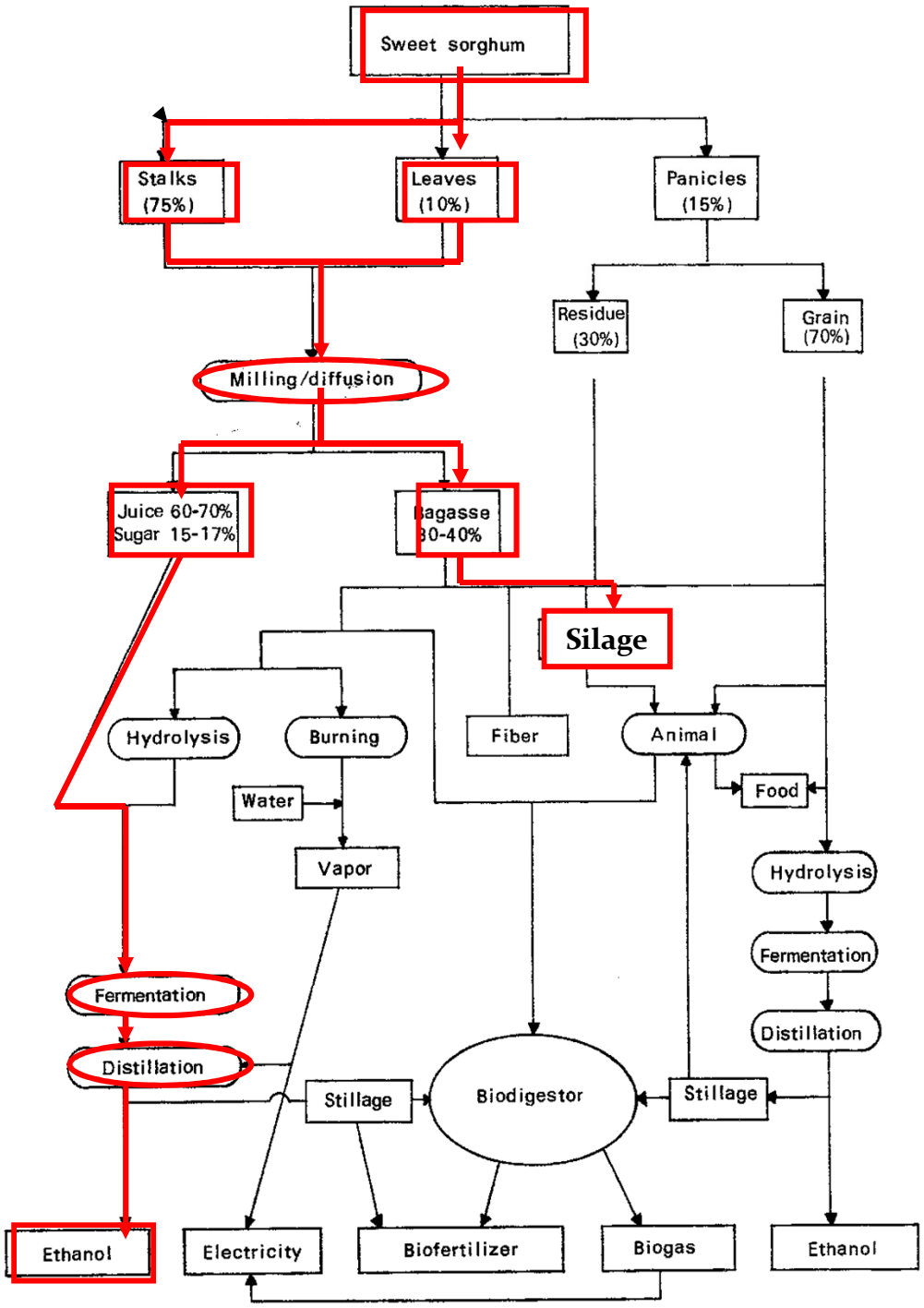
Feed	Requirement (mt)	Availability (mt)	Shortfall (%)
Concentrate	123	45	63.41
Green Fodder	1025	390	61.95
Dry Fodder	570	443	22.28

- Small ruminants in India mainly depend on grazing and browsing resources to meet their nutrient requirements.
- Now a days – Continuous depletion of grazing land
- Grazing lands are converted to irrigated lands & SEZ of industries

Possible alternatives

- Conservation of fodders
- Utilization of crop residues
- Incorporation of unconventional feed stuffs (AIBP)

The potential uses of sweet sorghum for food, fiber, fertilizer, ethanol, and methane gas production



Sweet Sorghum Bagasse

- Higher biological value
- Rich in micronutrients
- Used as feed and good for silage making (Rao *et al.* 2009).
- Sweet sorghum bagasse and stripped leaves provide a valuable, tradable feed resource (Blümmel *et al*. 2009).

Objectives of Investigation

- To study the effect of supplementation of concentrate at different levels to SSB silage on nutrient utilization and N balance in growing Nellore ram lambs.

MATERIALS AND METHODS

- **Procurement of bagasse:**

  Decentralized crushing unit of ICRISAT, Patancheru, Daulathabad, Medak district.

SILAGE MAKING

- Size of silo-12 LX9WX6H
- Moisture -60%
- Chopping length-1.5-2cm

Additives

- Molasses- 1%
- Urea- 0.5%
- Salt – 0.5%

Incubation period: 30 days

EXPERIMENTAL DESIGN

- Growth trial cum metabolism trial
- Growth trial- 4 months
- Twenty eight Nellore ram lambs of 3-4 months old with an average body weight of 12-14 kg were divided in to 4 groups comprising 7 animals in each group/treatment.
- The following treatments were allotted at random to the 4 groups of Nellore ram lambs.

1. Sole SSB silage feeding
2. SSB Silage + concentrate @ 0.75 % of their live weight
3. SSB Silage + concentrate @ 1% of their live weight
4. SSB Silage + concentrate @ 1.25% of their live weight

Ingredient composition (g/kg) of concentrate mixture

Name of the ingredient	Concentrate mixture
Maize grain	310.0
Ground nut cake	165.0
Sunflower cake	200.0
De oiled rice bran	230.0
Molasses	50.0
Urea	15.0
Mineral mixture	20.0
Salt	10.0

CP 17% and ME 10.6 MJ/kg DM

METABOLISM TRIAL:

- At the end of growth trial – 16 ram lambs -4X4
- Adaptation period : 5 days
- Collection period : 7 days
- Samples of offered feed, left over feed, faeces and urine samples was collected.
- Analysis of samples: proximate principles (AOAC, 1997) and fiber fraction (Van Soest *et al.* 1991).
- Urine was analyzed for nitrogen content (AOAC, 1997).

RESULTS AND DISCUSSION

Chemical composition of experimental rations

Proximate principle	SSB silage	Concentrate mixture
Dry matter	34.83	89.50
Organic matter	92.46	88.31
Crude protein	7.48	17.27
Ether extract	1.99	3.45
Crude fibre	37.14	9.34
Nitrogen free extract	45.86	58.25
Total ash	7.53	11.68

Cell wall constituent	SSB silage	Concentrate mixture
Neutral detergent fibre	71.81	32.05
Acid detergent fibre	46.75	13.32
Hemicellulose	25.06	18.73
Cellulose	31.16	7.09
Acid detergent lignin	9.05	3.11

- **Effect of feeding SSBLR silage supplemented with different levels of concentrate on dry matter intake in growing Nellore ram lambs**

Parameter	R-I	R-II	R-III	R-IV	SEM
Body weight (Kg)	13.5 ^{b}	19.1^{a}	20.2^{a}	20.7^{a}	0.80
Metabolic body weight (Kg)	7.02^{b}	9.13^{a}	9.51^{a}	9.69^{a}	0.29
Total DMI	343^{b}	608^{a}	700^{a}	613^{a}	41.1

NUTRIENT DIGESTIBILITY

PARAMETER	R-I	R-II	R-III	R-IV	SEM
Dry matter	53.42±1.10	55.53±2.21	56.31±1.68	58.44±1.26	0.86
Organic matter	55.63±1.73^{b}	56.86±0.95^{b}	57.05±1.06^{b}	60.20±0.77^{a}	0.62
Crude protein	62.81±1.02^{b}	64.37±1.13^{ab}	67.19±1.56^{ab}	68.06±1.05^{a}	0.75
Ether extract	71.93±2.10	74.72±1.38	78.12±1.56	78.27±2.24	0.63
Crude fibre	51.35±2.10	53.83±2.04	54.64±1.69	56.32±1.94	0.98
Nitrogen –free extract	57.07±1.61^{b}	62.66±1.40^{a}	61.89±1.63^{a}	64.68±1.48^{a}	1.10

NUTRIENT DIGESTIBILITY

Cell wall constituents					
Neutral detergent fibre	59.43±2.44	60.08±2.68	62.48±2.44	62.52±2.09	1.14
Acid detergent fibre	50.01±2.81	51.28±2.29	53.24±2.30	53.53±2.02	1.12
Hemicellulose	60.62±1.66	62.03±1.62	65.40±2.07	66.07±2.52	1.07
Cellulose	51.23±2.16	52.49±1.89	55.82±1.32	55.95±1.91	0.98

NITROGEN BALANCE

PARAMETER	R-I	R-II	R-III	R-IV	SEM
N intake (g/d)	4.11±0.35^{b}	9.66±0.55^{a}	11.53±0.21^{a}	11.26±0.98^{a}	0.81
Faceal N (g/d)	1.38±0.23^{b}	3.68±0.28^{a}	3.46±0.45^{a}	3.11±0.29^{a}	0.27
Urinry N (g/d)	2.93 ±0.55	3.82±0.23	4.75±0.11	4.26±0.45	0.24
Total N loss (g/d)	4.31±0.42^{b}	7.50±0.39^{a}	8.21±0.49^{a}	7.37±0.56^{a}	0.44
N balance (g/d)	-0.20±0.07^{c}	2.16±0.49^{b}	3.33±0.43^{ab}	3.90±0.79^{a}	0.57

CONCLUSION

- Sole SSBLR silage could not meet the protein and energy requirements.
- However, supplementation with concentrate mixture improved the digestibility and nitrogen balance in growing lambs.
- Recommended level of concentrate– 1.25 %