RESEARCH PROGRAM ON Livestock and Fish

CGIAR

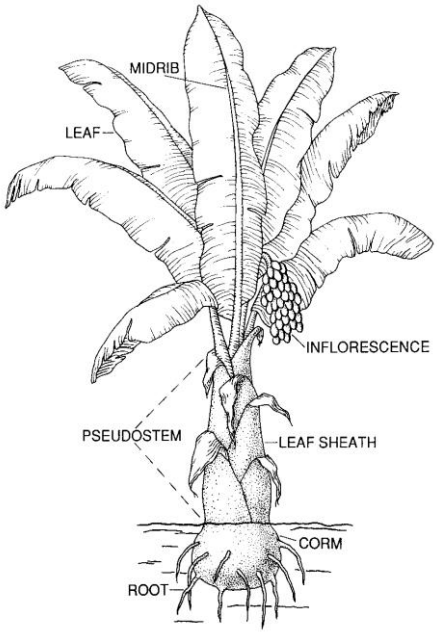
ILRI
INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE

Feed Intervention TechSheet 38

Feed intervention >> Supplementation and supplemental nutrition > Agro-industrial by-products

Wet by-products: Enset / bananas leaves and stems

Enset plantation



Enset plant parts

Description

- ✓ Enset (*Ensete ventricosum*) and banana (*Musa paradisiaca*) are large herbaceous monocot plants. Enset is larger than banana and can grow as high as 10 m in height.
- ✓ Both enset and banana have an underground corm, a bundle of leaf sheaths that form the pseudo-stem, and large leaves.
- ✓ Banana produces starch rich fruit for human consumption and leaves, pseudo-stem and peelings that can be used as animal feed.
- ✓ Enset pseudo-stem, corm and stalk inflorescence are used for human food and leaf pruning, enset thinning and occasionally all parts of the plant are used as animal feed.
- ✓ The pseudo-stem of both enset and banana has high moisture content.

Key benefits

- ✓ High biomass yield. The biomass yield of the leaves and pseudo-stem can be as high as 13-20 ton of DM/ha/year.
- ✓ Can provide year-round supplementary feed. The fully expanded lower leaves can be harvested and fed to animals without adverse effects on human food yield (fruit and starch).
- ✓ Enset tolerates low rainfall and short drought periods. It can also withstand heavy rainfall and flooding, which may cause heavy damage to other crops.
- ✓ The leaves have high protein content (13-17% crude protein).
- ✓ High digestibility. The leaves and the pseudo-stem have digestibility values of about 65 and 75%, respectively.
- ✓ The high water content in the pseudo-stem can be an advantage when drinking water is in short supply.

Key limitations

- ✗ The high water content in the pseudo-stem may limit DM intake.
- ✗ Low protein content in the pseudo-stem and corm.

TechFit is a tool to prioritize and select animal feed interventions. It was developed by ILRI under the leadership of Alan Duncan. It has been further refined and developed with inputs from many individuals in and beyond CGIAR. This is one of a series of feed intervention 'TechSheets' developed alongside the TechFit tool to provide summarized information on different interventions included in the tool. Werner Stür led the development of the TechSheets. This sheet was prepared by Adugna Tolera. TechFit is supported by the CGIAR Research Program on Livestock and Fish. ilri.org/techfit

Fruit bearing banana plant

Chopping and feeding whole enset plants to cattle

Where does this intervention fit?

Potential to overcome feed limitations	Score
• Feed scarcity during ***dry season*** :	medium
• Feed scarcity during ***cropping season*** :	medium
• Low feed availability :	medium
• Poor feed quality :	medium

Applicability to livestock		Score
Cattle/buffalo	• Breeding (cow-calf) :	medium
	• Fattening :	high
	• Dairy :	very high
Sheep/goats	• Breeding :	low
	• Fattening :	medium
Pigs	• Breeding (sow-piglets) :	low
	• Fattening :	medium

Applicability to farming system	Score
• Pastoral (extensive grazing systems) :	none
• Agro-pastoral/extensive mixed systems :	medium
• Intensive mixed crop-livestock system :	very high
• Landless livestock producers :	low

Requirement for resources		Score
Requirement for	• Land :	none
	• Water :	none
	• Labour :	medium
	• Cash/credit :	low
	• Access to inputs :	low
	• Knowledge/skills :	low

More information:

- ✓ Brandt, S.A., Spring, A., Heibesch, C., McCabe, J.T., Taboge, E., Diro, M., Wolde-Michael, G., Yntiso, G., Shigeta, M. and Tesfaye, S., 1997. The "Tree Against Hunger": Enset Based Agricultural Systems in Ethiopia. USA: AAAS.
- ✓ Nurfeta, A., 2008. Evaluation of the nutritive value of enset (Ensete ventricosum) as livestock feed in Ethiopia. PhD Thesis, Norwegian University of Life Sciences.
- ✓ Tolera, A., 2007. Feed Resources for Producing Export Quality Meat and Livestock in Ethiopia. Ethiopia Sanitary and Phytosanitary Standards and Livestock and Meat Marketing (SPS-LMM) Program, Addis Ababa, Ethiopia.

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