



Nutritive values of some commonly used feeds in sub-Saharan Africa: SSA Feeds—an online database

Why a feeds database?

Livestock often represent a major asset for smallholder farmers across the developing world. With an increasing demand for animal products led by growing populations, urbanization and dietary changes, feed has become a constraint for farmers to improve livestock production. However, while feed quality often remains low, demand and prices of feed keep rising. This reinforces the need for more efficient feed production and use.

The sub-Saharan Africa feeds composition database (SSA Feeds) was created by the CGIAR Systemwide Livestock Program (SLP) and data were first put online in 2004. In 2011, SLP released an enhanced version, both on the web and as a CD, containing information on the nutritive values of 20,913 samples of 566 of the major feeds used in 15 countries in sub-Saharan Africa. An extensive refresh of the data took place in 2020, including the addition of a substantial block of new results. The database now includes 44,203 samples of 738 types of feed from 19 countries.

Creation of this useful information tool was supported by the Sanitary and Phytosanitary Standards and Livestock and Meat Marketing Program of the Texas Agricultural Experiment Station in Ethiopia, with funding from USAID to the Ethiopian Institute of Agricultural Research and ILRI.

The aim of SSA Feeds is to enable the extension, development and research community to design scientifically based and best-cost rations for meat, dairy and draught animals of small-scale African farmers. As their livestock assets become healthier and better nourished, these farmers become more food-secure and able to increase their income from animal products.

Data sources

The nutritional data on livestock feeds made available through SSA Feeds were generated at the Animal Nutrition/Analytical Services Laboratories of the International Livestock Centre for Africa (ILCA), later the International Livestock Research Institute (ILRI) in Addis Ababa, Ethiopia. The laboratory analyses were performed as described by Osuji et al. (1993) and Ogubai and Sereke (1997). The initial dataset in the database was the same as that published by Anindo et al. (1994). However, this was modified extensively to exclude duplicate entries and extreme cases of outliers. Therefore, the nutritive values obtained here may differ substantially from that publication.



Included variables

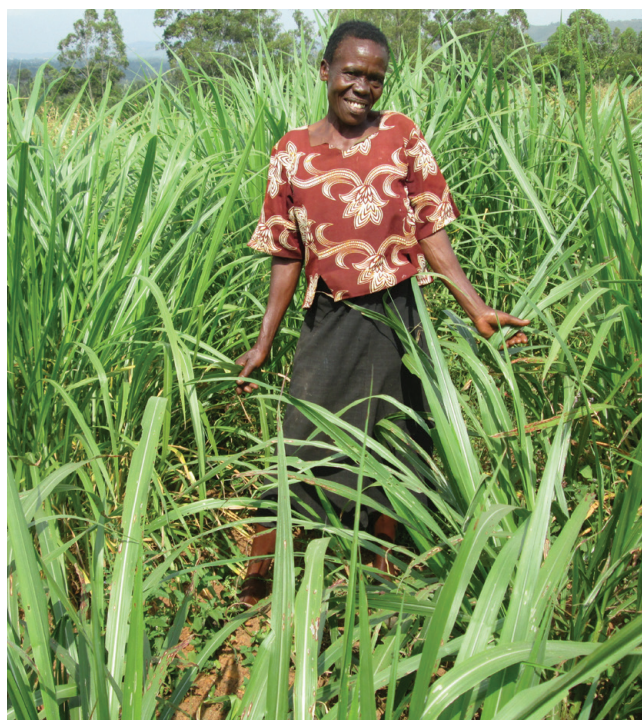
SSA Feeds (<https://feedsdatabase.ilri.org/>) provides data on the following nutritional values (where available).

Variable	Variable name	Unit	Method/reference
DM	Dry matter	% dried basis	105°C, 12 hours overnight
OM	Organic matter	% of DM	500°C, 12 hours overnight
ADF	Acid detergent fiber	% of DM	van Soest and Robertson (1985)
NDF	Neutral detergent fiber	% of DM	van Soest and Robertson (1985)
ADL	Acid detergent lignin	% of DM	van Soest and Robertson (1985)
CP	Crude protein	% of DM	Kjeldhal, N × 6.25
IVDMD	In vitro dry matter digestibility	% of DM	Tilley and Terry (1963)
ME	Metabolizable energy	MJoule/kg DM	Modified NRC (1996, 2000, 2001)
NE _m	Net energy for maintenance	MJoule/kg DM	NRC (1996, 2000, 2001)
NE _g	Net energy for gain	MJoule/kg DM	NRC (1996, 2000, 2001)
NE _l	Net energy for lactation	MJoule/kg DM	NRC (1996, 2000, 2001)
Ca	Calcium	g/kg of DM	Atomic absorption spectro-photometry (AAS) (Harris 1970)
P	Phosphorus	g/kg of DM	Flow injection analysis (Harris 1970)
Cu	Copper	ppm, DM	AAS (Harris 1970)
Fe	Iron	ppm, DM	AAS (Harris 1970)
K	Potassium	g/kg of DM	AAS (Harris 1970)
Mg	Magnesium	g/kg of DM	AAS (Harris 1970)
Mn	Manganese	ppm, DM	AAS (Harris 1970)
Na	Sodium	ppm, DM	AAS (Harris 1970)
Zn	Zinc	ppm, DM	AAS (Harris 1970)

The data are classified into nine broad categories:

- Herbaceous forages: 17,995 records
- Fodder trees and shrubs: 3,849
- Food crops (cereals and legumes, green): 3,064
- Food crops (cereals and legumes, residues): 13,719
- Food crops (roots and tubers): 1,348
- Food crops (others): 148
- Concentrate feeds and agro-industrial by-products: 3,981
- Mineral supplements: 15
- Other less common feeds: 84

Results can be exported as a csv table.



Example data

Feed type	CP (mean [SD])		ME (mean [SD])		IVDMD (mean [SD])	
Concentrate feeds and by-products						
Barley grain	10.2	[1.7]	10.5	[1.3]	68.3	[6.2]
Maize grain	7.4	[3.3]	11.3	[0.8]	73.3	[5.4]
Sorghum grain	10.5	[1.4]	12.6	-	-	-
Cottonseed cake	39.3	[8.8]	10.5	[1.3]	68.9	[7.8]
Groundnut cake	43.4	[17.2]	11.7	[0.8]	76.3	[5.2]
Linseed cake	29.9	[2.7]	10.5	[0.4]	69.8	[2.7]
Noug cake	32.7	[6.2]	8.8	[0.8]	61.5	[4.7]
Herbaceous forages						
Alfalfa (Medicago sativa)	19.5	[4.8]	9.6	[0.8]	67.6	[6.2]
Buffel grass (Cenchrus ciliaris)	8.3	[4.1]	8.8	[0.8]	61.6	[6.8]
Grasspea (Lathyrus sativus)	25.0	[7.0]	10.9	[0.8]	76.8	[5.7]
Guinea grass (Megathyrsus maximus)	7.8	[3.1]	8.4	[0.8]	58.4	[4.9]
Lablab hay (Lablab purpureus)	15.9	[3.2]	8.8	[0.4]	67.4	[6.7]
Napier grass leaf (Cenchrus purpureus)	8.8	[3.0]	9.2	[0.8]	64.5	[7.2]
Crop residues						
Barley straw	2.6	[1.4]	8.4	[0.4]	54.4	[4.9]
Cowpea hay	19.0	[7.4]	10.5	[0.8]	75.3	[9.8]
Groundnut haulms	12.7	[4.2]	9.2	[0.8]	64.9	[7.5]
Maize stover	4.4	[2.2]	9.6	[0.8]	64.2	[5.8]
Pearl millet stover	7.2	[3.9]	8.4	[0.8]	59.7	[4.3]
Wheat straw	3.7	[2.6]	8.4	[0.4]	58.6	[6.5]
Fodder trees and shrubs						
Leucaena (Leucaena leucocephala)	22.9	[5.6]	8.8	[1.3]	58.1	[8.5]
Sesbania (Sesbania sesban)	21.7	[6.4]	10.0	[1.3]	67.4	[8.3]
Moringa (Moringa oleifera)	23.2	[3.2]	11.3	[0.8]	79.1	[6.6]

CP=crude protein (% of dry matter (DM)); ME=metabolizable energy (MJoule/kg DM); IVDMD=in vitro dry matter digestibility (% of DM)

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Contact

Alan Duncan
Principal Scientist
Feed and Forage Development
a.duncan@cgiar.org
ILRI, Nairobi

Photos

ILRI/Diep Pham
ILRI/Apollo Habtamu
AVCD/FIPS/R. Jumah
ILRI/Paul Karaimu



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Patron: Professor Peter C Doherty AC, FAA, FRS

Animal scientist, Nobel Prize Laureate for Physiology or Medicine—1996

Box 30709, Nairobi 00100 Kenya
Phone +254 20 422 3000
Fax +254 20 422 3001
Email ilri-kenya@cgiar.org

ilri.org
better lives through livestock

ILRI is a CGIAR research centre

Box 5689, Addis Ababa, Ethiopia
Phone +251 11 617 2000
Fax +251 11 667 6923
Email ilri-ethiopia@cgiar.org

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