Identifying indigenous feed resources and their nutritive value in North Gondar Zone of Amhara Region

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Abstract

A study was conducted to identify indigenous feed resources and asses the current uses, abundance and their quality in selected Woredas (Metema, Gondar Zuria, Dembia, Debark and Dabat) of North Gondar, Amhara Region. Each 'woreda' were selected from North Gondar Zone as representative of kola, woynadega and dega Agro-ecologies. Eighty seven feed types were identified and collected. Representative samples of a total of eighty seven feed samples from Kola, Weynadega and Dega (20, 36 and 31) were collected from September to October (wet season). The feeds were classified into browse, herbaceous, and grass feeds. The feeding systems used by farmers include cut and carry, direct browsing/grazing and hay making. Chemical analysis of Metema feeds showed that 20% of the feeds have the potential to be used as a protein supplement as they contain more than 20 percent crude protein (CP). The study showed that feeds which have greater than 20 percent for Dembia and Gondar zuria, and Debark and Dabat respectively.

Key words: Feed, nutritive value.

Introduction

Livestock production can play a vital role in the livelihood of the farmers not only during bad production years, but also during normal years. One of the limiting factors to animal production in Ethiopia is nutrition (Tsige-yohannes, 1998). As a result of the low standard of feeding, the present level of productivity for all classes of animals is very low. Maximization of productivity and the contribution of the animal genetic resource to small farms depend to a very large extent on the availability of the total feed resources and on the efficiency of utilization of animal feeds (Seyoum and Zinash, 1989). Even if natural pasture and crop residues are the major feed resources, they are poor in quality and do not last long enough to sustain livestock production for the most part of the year in North Gondar particularly during the dry season. To cope up with problem of dry season feed shortage which could not even support the animal maintenance requirement, farmers traditionally divert to drought tolerant indigenous browse, herbaceous and grass feeds.

However, there is no much scientific information about these indigenous feed resources. Thus, this study was conducted to fill the knowing gap of concerning abundance, nutritive value and utilization of indigenous feeds in selected woredas of North Gondar, Amhara Region.

Materials and methods

Based on three agro-ecologies, *woredas* of North Gondar were clustered as '*kola*'(*hot*), '*weyinadega*'(*medium*) and '*dega*' (*cold*) purposively. The study was conducted in North Gondar Zone of the Amhara Region at Metema , Dembia and Gondar Zuria and Dabat and Debark representing '*kola*', '*weyinadegaand* '*dega*', *respectively*. Rapid survey integrated with focus group discussion was used for primary data collection process. Representative samples of available indigenous feed resources were collected from September to October (wet season) during on-farm data collection in support of key-informant farmers in each site where samples were taken.

A total of 87 feed samples from '*Kolla*' (low altitude), '*Weynadega*' (mid altitude) and '*Dega*' (high altitude), 20, 36 and 31, respectively, were stratified based on type of feed and agro-climatic zones. Samples of the same feed types were bulked together on agro-ecology bases and then thoroughly mixed and sub-sampled. The samples were dried in an oven at 65°C for 72 hours and ground in wily mill to pass through 1mm sieve and allowed to equilibrate at room temperature for 24hours. Feed analysis was done at Holeta Agricultural Research Center for Dry matter, Ash and CP using the method of AOAC (1990). NDF, ADF and ADL were analyzed by the method of Van soest (1982).

Results and discussion

Identified feed resources and their chemical compositions

The result of the study in Tables 1 to Table 3 showed that indigenous feed resources were identified in their common names, scientific names, cutting time/availability for feeding, mode of feeding, means of propagation, parts of the species eaten and livestock types feeding. The study showed that feed resources are classified into browses, herbaceous

plants, and grasses. Browse feeds resources are relatively green throughout the year. As a result, they are harvested (used) during the critical period of feed shortage (April to May) in all study areas. Herbaceous and grasses are used throughout the year according to their availability and no conservation practice of surplus feed for dry period.

Interviewed farmers in each agro-ecology responded that there is no practice of growing as well as conservation of indigenous feed resources for critical periods in the form of hay.

The CP content of feeds collected from Metema ranges from 6% for '*Jingra*' to 25% for '*Askir*' with a mean value of 15. Among the collected feed types, 20% of the feeds have the potential to be used as a protein supplement as they contain more than 20% CP. Among the collected feeds, '*Gimarda*' and '*Arka/Gaba*' have a CP of 25% and 23%, respectively. It was found that 55% of the feeds assessed in Metema were above the critical value of 10% CP. The average NDF content of feeds are 63 with maximum and minimum NDF content of 83% and 43.32%, respectively (Table 2)

LocalName	Location	Means of	Mean DM%	Mean Ash %	Mean OM%	Ave. NDF%	Ave.	Ave.	СР%
	of species	propagation					ADF%	Lign	
Kimo	Metema	seed	91.36	7.74	92.26	59.83	44.18	15.15	11.37
Shanshura	Metema	seed	91.46	16.24	83.76	78.88	54.65	7.26	7.60
Lalo	Metema	seed	91.61	15.33	84.67	43.32	31.09	8.35	16.22
Chara	Metema	seed	90.67	10.25	89.75	59.51	46.02	12.78	15.53
Tubas	Metema	seed	93.20	16.65	83.35	83.92	59.04	9.52	6.64
Goshboda	Metema		90.89	12.15	87.85	78.06	49.48	3.87	6.73
Arka/Gaba	Metema	seed	90.61	10.01	89.99	50.44	32.19	5.74	22.76
Gingra	Metema	Seed	89.44	20.97	79.03	70.43	58.11	7.54	6.09
Hochi	Metema	seed	90.60	9.09	90.91	50.87	35.99	12.94	14.40
Dirya	Metema	seed	90.42	14.04	85.96	73.88	40.10	16.55	14.93
Yekolawanza	Metema	seed	87.67	19.65	80.35	75.34	38.22	4.51	14.58
Gimarda	Metema	seed	90.33	10.08	89.92	62.65	43.83	11.16	25.28
Askir	Metema	seed	88.74	13.30	86.70	61.24	50.04	6.15	25.43
Wushadagusa	Metema	seed	88.74	15.17	84.83	73.88	45.96	4.70	9.82
Enkoy	Metema	seed	88.71	7.30	92.70	58.23	47.98	14.48	15.13
Yekolawanza	Metema	seed	87.34	14.86	85.14	71.40	63.98	15.32	13.79
Nechgirar	Metema	seed	90.64	12.90	87.10	56.90	43.15	6.39	16.07
Amirar	Metema		87.80	11.02	88.98	43.98	33.50	8.11	21.13
Gorgoro	Metema		88.98	6.41	93.59	59.49	52.81	15.45	16.93
Gambilo	Metema	seed	87.31	8.82	91.18	60.62	51.51	15.08	14.93

Table1. Chemical composition of indigenous feed resources at low altitude 'Kola' (Metema) Woreda of North Gondar Zone.

Local name	Location	Prop.	Mean DM%	Mean Ash %	Mean OM%	Av. NDF %	Av. ADF%	Av. Lign	CP%
Gaja	Dembia		91.89	10.10	89.90	77.19	46.58	8.17	5.96
Checho	Dembia	seed	90.73	7.58	92.42	32.53	25.03	6.25	16.24
Tebelel	G/Zuria		91.10	8.35	91.65	50.76	39.10	12.85	16.74
Nechgirar	Dembia	seed	90.11	6.96	93.04	68.39	47.89	16.06	21.69
Gingra	Dembia	seed	92.04	11.49	88.51	79.50	51.28	8.89	9.74
Atat	G/Zuria	seed	91.48	10.53	89.47	46.83	37.97	13.26	11.12
Gagrda	Dembia	seed	91.40	16.75	83.25	73.17	48.54	7.13	11.37
Yekoksar	Dembia	seed	91.12	15.08	84.92	74.65	46.27	7.31	9.07
Kumia	Dembia		92.51	15.97	84.03	71.62	44.68	8.73	13.05
Gidzemede	G/Zuria	seed	89.07	21.71	78.29	37.57	21.24	7.93	17.11
Zigta	G/zuria	seed	91.98	8.59	91.41	29.68	21.01	6.59	13.41
Gorteb	Dembia	seed	90.72	12.67	87.33	50.88	35.57	14.56	20.91
Selselo	Dembia		92.42	22.41	77.59	76.52	47.06	7.53	9.66
Wonberet	G/Zuria	seed	88.99	14.57	85.43	47.01	31.07	6.84	11.20
Gambilo	Dembia	seed	90.64	8.26	91.74	49.17	35.75	7.14	15.38
Dedho	G/Zuria		90.62	6.24	93.76	60.53	41.94	13.49	11.26
Lenquata	G/Zuria	seed	91.16	10.20	89.80	47.25	33.70	7.44	20.01
Tiranja	Dembia		90.27	13.94	86.06	73.85	40.39	2.46	12.87
Gimero	G/Zuria	seed	90.75	10.63	89.37	34.29	28.09	5.41	30.15
Sirsira	Dembia		88.04	11.19	88.81	84.17	48.26	6.83	13.33
Wanza	G/Zuria	seed	89.84	17.28	82.72	68.58	56.25	15.94	16.47

Table 2. Chemical composition of indigenous feed resources at Mid Altitude 'Woyinadega'(Dembia and Gondar zuria) Woredas of North Gondar Zone.

Prop. = Means of propagation.

Both in '*weynadega*' (Dembia and Gondar zuria) and '*dega*' (Debark and Dabat) areas, the study showed that feeds which have greater than 20% CP are 19 and 15.6%, respectively. In Dembia and Gondar zuria, '*Gimero*' and '*Kontir*' were the highest list of species with CP content of 30% and 27%, respectively. In general, the study in Debark and Dabat showed that 54.8% of indigenous feeds were with CP content more than 10% and also in Dembia and Gondar zuria were 61%. Hence, animals which have access to these feed resources can fulfill at least their protein requirement for maintenance.

Local			Mean	Mean	Mean	Δυρ	$\Delta v \rho$	Δνο	
LUcai	T	D	D	ivicali			AVC.		
name	Location	Prop.	DM%	Ash %	OM%	NDF%	ADF%	Lıgn	CP%
Amija	Debark	seed	90.77	6.42	93.58	46.41	37.71	15.17	17.73
Abejesh	Debark	seed	90.81	13.36	86.64	81.05	46.74	6.63	9.02
Amoja	Debark	seed	90.72	5.79	94.21	36.48	26.01	9.24	15.06
Mesela	Debark	roots	88.53	7.52	92.48	64.64	41.56	8.28	8.54
Abejesh	Debark	seed	91.29	9.68	90.32	83.01	46.46	8.45	7.31
Sirsira	Dabat	seed	91.42	8.15	91.85	73.58	40.08	7.24	5.59
Yesewlut	Debark	seed	88.62	18.87	81.13	35.31	24.24	7.99	23.01
Boren	Debark	seed	89.26	8.69	91.31	49.10	37.25	9.47	10.77
Almit	Dbark	seed	89.69	15.93	84.07	34.45	31.89	12.73	25.76
Jeroasfit	Debark		90.40	12.79	87.21	44.05	42.87	8.13	16.00
Yeahiyatosign	Debark	seed	89.38	9.00	91.00	63.22	55.01	4.99	9.40
Guasa	Debark	roots	91.60	9.23	90.77	77.35	49.11	3.45	10.47
Higsar	Dabat	seed	90.60	14.34	85.66	69.30	44.85	2.90	12.39
Telnji	Debark		89.88	14.41	85.59	66.71	44.86	9.21	13.59
Gaja	Debark	seed	90.80	8.32	91.68	81.95	47.00	3.80	7.71
Woyira	Debark	seed	91.07	6.52	93.48	79.11	40.51	7.67	18.68
Yewushalut	Debark	seed	89.31	13.90	86.10	53.11	46.01	9.71	21.05
Abatlut	Dabat	seed	91.53	18.60	81.40	35.42	30.23	10.54	15.31
Muja	Debark	seed	87.17	14.20	85.80	73.92	40.00	8.80	11.38
Wuchena	Debark	seed	89.67	5.14	94.86	57.54	38.88	9.38	12.26
Gicha	Dabat	seed	88.34	10.58	89.42	75.49	41.71	10.05	10.46
Wajima	Debark	seed	90.73	12.06	87.94	45.95	34.22	4.88	18.53
Keygrar	Debark	seed	90.67	14.14	85.86	44.29	36.26	6.53	16.82
Yesewtosign	Debark	seed	89.40	9.38	90.62	57.05	48.31	12.67	8.11
Gaja	Dabat	seed	90.40	10.12	89.88	78.03	41.41	4.24	7.02
Qega	Debark	seed	88.11	7.24	92.76	32.77	22.81	5.60	20.14
Meresar	Dabat		89.73	17.61	82.39	77.86	51.73	6.02	11.22
Serdo	Dabat	Stem, branch	89.24	11.21	88.79	77.43	42.37	5.04	10.68
Nechgirar	Dabat	seed	91.37	13.11	86.89	57.16	43.76	5.68	16.56
Boren	Debark	seed	86.49	7.28	92.72	49.54	43.61	7.76	8.89
Girar	Debark	seed	87.82	8.87	91.13	82.92	72.61	14.38	24.39

Table 3. Chemical composition of indigenous feed resources at High Altitude '*Dega*' (Dabat and Debark) *Woredas* of North Gondar Zone.

Prop. = Means of propagation.

Conclusion and recommendation

'*Gumero'*, '*Almit'* and '*Askir'* are browse feed species which have a potential CP content of 30%, 26% and 25% and were found in mid, high and low altitude areas, respectively. Farmers in each agro-ecologies responded that there is no practice of growing of indigenous feeds as well as insignificant conservation for critical periods. Feeds that have crude protein content of 10% and higher are selected for further agronomic and animal evaluation studies. The average NDF (Neutral Detergent Fiber) value of feed resources in '*kola'*, '*weynadega'* and '*dega'* areas were found to be 64%, 58% and 58%, respectively which is more than 45%. High NDF value indicates poor quality, which is attributed to high structural components resulting to low digestion, low rate of passage and limited voluntary intake (McDowell, 1988).

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