Availability and nutritional value of wild forages as feed for pigs and mithun in Nagaland, India

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Availability and nutritional value of wild forages as feed for pigs and mithun in Nagaland, India

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Acknowledgements

We hope that this study carried out jointly by the International Livestock Research Institute (ILRI) and the National Research Centre on Mithun (NRCM), one of the institutes under the Indian Council of Agricultural Research (ICAR) is a valuable contribution in the feeding of pigs and mithun in Nagaland. The study aims to promote smallholder farmers to effectively incorporate locally-available feed resources in the feeding regimes of their pigs and mithun by knowing the nutritional value and presence or absence of anti-nutritional factors in the different forages.

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Introduction

Livestock is an integral component of the farming system in northeast India. Animals are an important source of food and a source of income. Most of the people in the northeast are non-vegetarians. The demand for animal source food in the region is increasing rapidly, but production is not growing, mainly because of constraints in feed and fodder production and availability. Baruah (2002) reported a chronic deficiency of concentrates (82.6%) and green fodder (53.6%) in the northeast hill region. Thus, many farmers resort to feeding their animals with wild forages from local forests. It constitutes about 40% of daily diet of pigs in Nagaland. However, there is not much information available about the nutritional quality of these forages.

In this context, ILRI, as part of the TATA-ILRI partnership program met with colleagues at the National Research Centre on Mithun (NRCM) to explore ways to fill this information gap and study wild forages commonly fed to pigs and mithun in Nagaland. The result is this joint study, which is expected to benefit both pig rearers and farmers keeping mithun in the region. The results will help to promote use of these alternate feed resources for their efficient utilization at the farmer level.

Methodology

The study was carried out in four selected districts of Nagaland representing different altitudes such as Mokokchung (low altitude), Wokha (medium altitude), Kohima and Tuenseng (high altitude) in two seasons (July-August and January-February). In each district forage samples were collected (those exceeding more than 5% of total dry matter in the ration) from four villages (Table 1). The taxonomy of collected plants was identified by a botanist and dried ground samples were sent to NRCM laboratory at Jharnapani and ILRI's NIRS laboratory at Hyderabad for analysis of proximate principles such as crude protein, fibre (NDF, ADF, ADL), organic matter and ash. Besides, IVOMD and anti-nutritional factors such as total phenolic componds (Tannic acid equivalent) and cyanogenic glycosides were also analysed.

Table 1: Wild forage study – sampling matrix

Districts	Villages	No of wild forages Round 1 (Jul-Aug, 2014)	No of wild forages Round 2 (Jan-Feb, 2015)
Kohima	Khonoma	10	2
	Mezoma	16	1
	Sechuma	8	2
	Kiruphema	5	2
Total	4	39	7
Wokha	Chukitong	4	1
	Seluku	10	2
	Koio	3	1
	Longsa	2	1
Total	4	19	5
Mokokchung	Mekuli	6	1
	Sabangya	12	3
	Longpha	5	1
	Longmisa	7	2
Total	4	30	7
Tuensang	Kuthur	9	1
	Hakchang	14	4
	Ngangpong	7	1
	Alisopur	10	2
Total	4	40	8
Total	16	128	27

Results

Results of the study on nutritional and anti-nutritional principles present in the forage samples collected are presented in the following sections.

Most of the plants analysed are found to contain CP ranging from 6.61 to 29.97%. Neutral detergent fibre (NDF) and acid detergent fibre (ADF) is observed to be 55.15 and 37.97%, respectively. In vitro organic matter digestibility (IVOMD) in selected forages were observed to vary between 46.78 to 66.52%. The total phenolic compounds (Tannic acid equivalent) and cyanogenic glycosides content found to vary between 0.59 to 31.46 and 0.003 to 0.059%, respectively. The cyanogenic glycoside was observed only in 3.9% of the forages.

It gives an impression that all the forages evaluated are good sources of protein and energy with no significant levels of the total phenolic compounds and glycosides that can make nutrients unavailable to the animals. Moreover, few plants having higher levels of total phenolic compounds needs to be assessed for their nutraceutical effects.

Finally, it can be concluded that all the tested forages available in the forests can be promoted among farmers for their use. Some of the promising species such as Colocasia spp., Debregeasia longifolia, Ficus hispida and Trema orientalis can also be cultivated in the back yard/homestead depending on availability of space.

Plants collected from Kohima district

1. Alchornea *cordifolia* (Mezha, Medza)

Mezha (Alchornea *cordifolia*) is a perennial shrub found in forest of Nagaland (Kohima). It is characterized by woody stem, broad and simple leaf, dichasium inflorescence with white flower. The leaf is used as feed for pigs by farmers. It is available mainly during autumn season. The plant in autumn season is found to contain:

Crude Protein - 15.50%
NDF - 66.57%, ADF -50.81%, ADL - 7.21%
Test for anti-nutritional factors showed that it has total phenolic compounds - 1.12%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

2. Alternanthera *sessilis* (Papanrü , Dzubuo)

Alternanthera sessilis (Papanrü) is an annual herb found in Nagaland (Kohima). It is characterized by hollow and simple stem, simple and opposite decussate leaf, raceme inflorescence with white flower. Leaves and stems are used as feed for pigs by farmers. It is available mainly during summer, autumn and winter seasons. The plant in autumn season is found to contain:

Crude protein - 21.3%
NDF - 47.34%, ADF -24.74%, ADL - 3.60%
Test for anti-nutritional factors showed that it has total phenolic compounds - 2.20%
(See Annex I for taxonomical classification and Annex II for chemical composition)

3. Angiopteris spp. (Gathula, Gasulo)

Angiopteris spp. (Gathula) found in forest of Nagaland (Kohima) is a pteridophytic herb. It is characterized by fleshy rhizomes, bipinnate leaf. Leaves and tender petioles are used as feed for pigs by farmers. It is found mostly during summer and autumn seasons. The plant in autumn season is found to contain:

Crude protein - 18.23%
NDF - 60.29%, ADF -48.96%, ADL - 7.45%
Test for anti-nutritional factor is found to have total phenolic compounds - 2.16%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

4. Bidens *pilosa* (Tenrutsuthu, Temvutsuthu)

Bidens pilosa (Tenrutsuthu) is an annual herb found in Nagaland (Kohima, Wokha, Mokokchung). The plant is characterized by herbaceous and quadriangular stem, opposite decussate leaf and capitulum inflorescence with white and yellow flower. Leaves and tender stems are used as feed for pigs. It is available mainly during spring, summer and autumn seasons. The plant in autumn season is found to contain:

Crude protein - 17.60%
NDF - 56.33%, ADF -45.32%, ADL - 4.89%
Test for anti-nutritional factor is found to have total phenolic compounds - 3.70%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

5. Boehmeria platyphyllla (Lovie, Zozie)

Boehmeria *platyphylla* (Lovie) is a perennial sub-shrub found in Nagaland (Kohima, Tuensang). The plant is characterized by simple stem, alternate leaf, catkin inflorescence with condensed white flower. Leaves are used as feed for pigs by farmers. It is available mainly during autumn season. The plant in winter season is found to contain:

Crude protein - 22.80%
NDF - 53.32%, ADF -38.86%, ADL - 5.87%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 1.61%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

6. Clerodendrum *colebrookianum* (Gatherü Gathere)

Clerodendrum *colebrookianum* (Gatherü) is a perennial shrub found in Nagaland (Kohima). The plant is characterized by quadriangular stem, broad and alternate leaf, cymose inflorescence with white flower. Leaves are used as feed for pigs by farmers. It is available mostly during soring, summer autumn and winter seasons. The plant in autumn season is found to contain:

Crude protein - 29.97%
NDF - 61.81%, ADF -47.83%, ADL - 4.48%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 1.07%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

7. Colocasia spp. (Zürü, Thekru-kruzie)

Colocasia spp.(zürü) is a rhizomatous herb found in forest of Nagaland (Kohima). It is characterized by stem which is modified into root stock, petiolate leaf, spadix inflorescence with white flower. Leaves and petioles are used as feed for pigs by farmers. It is available mostly during autumn and summer seasons. The plant in autumn season is found to contain:

Crude protein - 13.63%
NDF - 60.31%, ADF -40.83%, ADL - 6.02%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 1.33%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

8. Commelina *benghalensis* (Theüprü)

Commelina *benghalensis* (Theüprü) is an annual herb found in forest of Nagaland (Kohima). It is characterized by jointed and succulent stem, simple and alternate leaf with sheath base, solitary inflorescence with blue flower. Leaves and stems are used as feed for pigs by farmers. It is mostly available during autumn season. The plant in autumn season is found to contain:

Crude protein - 14.23%
NDF - 57.35%, ADF -44.72%, ADL - 5.80%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 2.20%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

9. Commelina *obliqua* (Therüprü, Thevobuoto)

Commelina *obliqua* (Therüprü) is an annual herb found in forest of Nagaland (Kohima). It is characterized by jointed and succulent stem, simple and alternate leaf with sheath base and cymose inflorescence with purple flower. Leaves and stems are used as feed for pigs by farmers. It is available during autumn and winter season. The plant in autumn season is found to contain:

Crude protein - 11.53%
NDF - 57.83%, ADF -39.27%, ADL - 5.69%
Analysis of the same plant in winter revealed that it has higher crude protein - 21.30%
Tests for anti-nutritional factors showed that it has Total phenolic compounds - 4.24%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

10. Curcuma montana (Füfü, Pfupfu)

Curcuma longa (Füfü) is an annual tuberous herb found in forest of Nagaland (Kohima). It is characterized by sympodial tuberous stem, spirally arranged leaf with elongated petiole, receme inflorescence with pink flower. Young, tender leaves are used as feed for pigs by farmers. It is mostly available during autumn and summer seasons. The plant in autumn season is found to contain:

Crude protein - 16.92%
NDF - 68.87%, ADF -33.80%, ADL - 3.15%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 5.64%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

11. Dioscorea pentaphylla (Kiphie, Ruphie)

Dioscorea pentaphylla (Kiphie) is an annual twining herb found in forest of Nagaland (Kohima). It is characterized by twining stem which bears areal tubers, palmately compound leaf, receme inflorescence with white flower. Leaves and tubers are used as feed for pigs by farmers. It is mostly available during autumn and winter seasons.The plant in autumn season is found to contain:

Crude protein - 18.47%
NDF - 50.70%, ADF -37.76%, ADL - 5.25%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 1.97%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

12. Elatosema *disssectum* (Zielhounrü)

Enlatosema *disssectum* (Zielhounrü) is an annual perennial herb found in forest of Nagaland (Kohima, Tuensang). It is characterized by simple stem, simple and alternate leaf with dissected margin, capitulum inflorescence with condensed, white flower. Leaves and tender stems are used as fodder for pigs by farmer. It is mostly available during autumn season. The plant in autumn season is found to contain:

Crude protein - 19.58%
NDF - 44.31%, ADF -37.86%, ADL - 5.18%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 1.25%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

13. Erigeron *bonariensis* (Süta)

Erigeron *bonariensis* (Süta) is an annual herb found in Nagaland (Kohima). It is characterized by simple stem, simple whorled leaf, capitulum inflorescence with white flower. Leaves are used as feed for pigs by farmers. It is mostly available during autumn and summer. The plant in autumn season is found to contain:

Crude protein - 23.78%
NDL-57.62%, ADF -38.41%, ADL - 5.09%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 2.70%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

14. Erythrina variegata (Hutuo)

Erythrina *variegata* (Hieto) is a perennial tree found in Nagaland (Kohima). It is characterized by woody stem with thorns, trifoliate leaf, racemose receme inflorescence, red coloured flower. Young leaves are used as feed for pigs by farmer. It is mostly available during autumn and summer seasons. The plant in autumn season is found to contain:

Crude protein - 24.16%
NDF - 57.72%, ADF -36.12%, ADL - 5.83%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 5.02%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

15. Ficus *hispida* (Temichede)

Ficus *hispida* (Temichede) is a perennial tree found in forest of Nagaland (Kohima and Mokokchung). It is characterized by presence of milky latex on stem and leaf, woody stem, Simple alternate leaf, hypenthodium inflorescence. Leaves are used as feed for pigs by farmers. It is available during autumn and winter season. The plant in autumn season is found to contain:

Crude protein - 20.69%
NDF - 59.27%, ADF -34.53%, ADL - 5.50%
Analysis of the same plant in winter revealed that it has lower crude protein - 16.97%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 1.75%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

16. Gmelina *arborea* (Thogwü, Thobvu)

Gmelina *arborea* (Thogwü) is a perennial tree found in Nagaland (Kohima, Mokokchung). It is characterized by woody stem, simple and alternate leaf, cymose inflorescence, yellow coloured flower. Leaves are used as fodder by farmers. It is mostly available during autumn and summer seasons.. The plant in autumn season is found to contain:

Crude protein - 18.56%
NDF - 56.54%, ADF -38.58%, ADL - 9.02%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 5.33%
Cyanogenic glycoside - 0.059%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

17. Gynura *crepidiodes (Tephrie-Nhasa)*

Gynura *crepidioides* (Nhasa) is an annual herb found in Nagaland (Kohima). It is characterized by simple stem, pinnately compound leaf, capitulum inflorescence with white flower. Leaves and stems are used as fodder by farmers. It is available mainly during autumn and summer seasons.The plant in autumn season is found to contain:

Crude protein - 28.58%
NDF - 47.17%, ADF -38.50%, ADL - 5.47%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 1.43%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

18. Gynura *cusimbua* (Keko)

Gynura *cusimbua* (Keko) is an annual herb found in Nagaland (Kohima, Wokha, Mokokchung). It is characterized by succulent stem, pinnately compound leaf, capitulum inflorescence with red flower. Leaves and stems are used as fodder by farmers. It is available mainly during autumn season. The plant in autumn season is found to contain:

Crude protein - 14.17%
NDF - 48.31%, ADF -38.08%, ADL - 6.05%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 1.09%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

19. Impatiens spp. (Tsiekie)

Impatiens spp. (Tsiekie) is an annual herb found in forest of Nagaland (Kohima, Tuensang). It is characterized by succulent stem, simple and alternate leaf, solitary inflorescence and purplish white coloured flower. Leaves and stems are used as feed for pigs by farmers. It is available mainly during autumn season. The plant in autumn season is found to contain:

Crude protein - 24.14%
NDF - 63.19%, ADF -51.00%, ADL - 6.29%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 2.36
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

20. Kydia *calcycina* (Ketsasei)

Kydia *calcycina* (Ketsasei) is a perennial tree found in the forest of Nagaland (Kohima). It is characterized by woody stem, broad, simple and alternate leaf, receme inflorescence with tiny pink flowers. Leaves are used as feed for pigs by farmers. It is available mainly during autumn season. The plant in autumn season is found to contain:

Crude protein - 17.16%
NDF - 66.96%, ADF -53.98%, ADL - 7.38%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 2.96%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

21. Laportia spp. (Lovie, Mithu zozie)

Laportia spp. (Lovie) is a perenial sub-shrub found in forest of Nagaland (Kohima). It is characterized by presence of numerous stinging hairs on the surface of stems and leaves, fibrous stem, palmately compound leaf, catkin inflorescence with condensed flower. Leaves are used as feed for pigs by farmers. It is available mainly during autumn summer and winter seasons. The plant in autumn season is found to contain:

Crude protein - 24.20%
NDF - 53.39%, ADF -45.83%, ADL - 4.81%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 1.20%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

22. Leea *sambucina* (Huru, Kejahuru)

Leea *sambucina* (Huru) is a perennial shrub found in forest of Nagaland (Kohima, Wokha, Tuensang). It is characterized by hollow stem, pinnately compound leaf, corymb inflorescence, white flower. Leaves are used as feed for pigs by farmers. It is available mainly during autumn and summer seasons. The plant in autumn season is found to contain:

Crude protein - 12.94%
NDF - 53.67%, ADF -45.88%, ADL - 7.99%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 1.02%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

23. Mikania *cordata* (Kerienha)

Mikania *cordata* (Kerienha) is an annual climber found in forest of Nagaland (Kohima). It is characterized by climbing stem, simple cordate leaf, capitulum inflorescence, flowers are white in colour. Leaves are used as feed for pigs by farmers. It is available mainly during autumn and summer seasons. The plant in autumn season is found to contain:

Crude protein - 14.44%
-NDF - 55.68%, ADF -32.30%, ADL - 5.53%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 1.34%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

24. Mussaenda *frondosa* (Terhobiepou, Terhuobie)

Mussaenda *frondosa* (Terhobiepou) is a perennial shrub found in forest of Nagaland (Kohima, Tuensang). It is characterized by woody stem, opposite decussate leaf, cymose inflorescence, yellow flower, sepal modified into large white leaf like structure. Leaves are used as feed for pigs by farmers. It is available mainly during autumn and summer seasons. The plant in autumn season is found to contain:

Crude protein - 14.36%
NDF - 62.55%, ADF -36.60%, ADL - 7.07%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 4.94%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

25. Oenanthe *javanica* (Gakra)

Oenanthe *javanica* (Gakra) is an annual herb found in forest of Nagaland (Kohima). It is characterized by presence of soft herbaceous stem, pinnately compound leaf with long petiole, umbel inflorescence, white coloured flower. Leaves, petioles and stems are used as feed for pigs by farmers. It is available mainly during autumn and summer seasons. The plant in autumn season is found to contain:

Crude protein - 18.42%
NDF - 42.48%, ADF -26.97%, ADL - 4.69%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 1.43%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

26. Osbeckia *capitata* (Khukhie, Koukhe)

Osbeckia *capitata* (Khukhie) is a perennial shrub found in forest of Nagaland (Kohima, Wokha, Mokokchung).It is characterized by woody stem, simple and opposite decussate leaf, cymose inflorescence and purple coloured lower. Leaves are used as feed for pigs by farmers. It is available during autumn and winter season. The plant in autumn season is found to contain:

Crude protein - 10.72%
NDF - 55.31%, ADF -36.42%, ADL - 7.89%
Analysis of the same plant in winter revealed that it has higher crude protein - 19.23%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 7.21%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

27. Pilea *senipta* (Gati)

Pilea *senipta* (Gati) is an annual herb found in forest of Nagaland (Kohima). It is characterized by succulent stem, alternate leaf, cymose inflorescence, condensed white flower. Leaves and stems are used as feed for pigs by farmers. It is available mainly during autumn season. The plant in the autumn season is found to contain:

Crude protein - 23.26%
NDF - 51.31%, ADF -39.65%, ADL - 5.25%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 1.74%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

28. Polygonum *chinenses* (Gare)

Polygonum *chinenses* (Gare) is an perennial herb found on forest of Nagaland (Kohima, Mokokchung, Tuensang). It is characterized by succulent stem, alternate leaf with ochreate stipule, racemose inflorescence and white flower. Leaves and stems are used as feed for pigs by farmers. It is available during summer, autumn and winter season. The plant in autumn season is found to contain:

Crude protein - 11.26%
NDF - 62.29%, ADF -38.21%, ADL - 10.90%
Analysis of the same plant in winter revealed that it has higher crude protein - 15.15%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 1.25%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

29. Polygonum *hydropiper* (Chusiga, Thevopruzie)

Polygonum *hydropiper* (Chusiga) is an annual herb found in forest of Nagaland (Kohima). It is characterized by simple stem, alternate leaf with ochreate stipule, racemose inflorescence and pink flower. Leaves are used as feed for pigs by farmers. It is available mainly during autumn and summer seasons. The plant, in the autumn season is found to contain:

Crude protein - 18.85%
NDF - 67.65%, ADF -54.42%, ADL - 8.06%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 8.47%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

30. Polygonum *runcinatum* (Prugi, Pruzie)

Polygonum *runcinatum* (Prugi) is an annual herb found in forest of Nagaland (Kohima, Tuensang). It is characterized by succulent stem, simple and alternate leaf with ochreate stipule, cymose umbel inflorescence with white flower. Leaves and stems are used as fodder. It is available mainly during autumn and summer seasons. The plant, in the autumn season is found to contain:

Crude protein - 18.11%
NDF - 67.47%, ADF -39.41%, ADL - 6.27%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 7.51%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

31. Pouzolzia *viminea* (Yedu)

Pouzolzia *viminea* (Yedu) is a perennial shrub found in forest of Nagaland (Kohima, Tuensang). It is characterized by woody, densely branched stem, simple, alternate leaf, verticillaster inflorescence with condensed, green flowers. Leaves are used as fodder. It is available mainly during autumn season. The plant, in the autumn season is found to contain:

Crude protein - 15.04%

NDF - 60.79%, ADF -50.74%, ADL - 7.74%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 2.71%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

32. Rhus *semialata* (Tsomhu, Zhomhou)

Rhus *semialata* (Tsomhu) is a perennial tree found in forest of Nagaland (Kohima, Wokha). It is characterized by woody stem, unipinnate leaf, racemos inflorescence with white flower. Young leaves are used as feed for pigs by farmers. It is available mainly during autumn and summer seasons. The plant in the autumn season is found to contain:

Crude protein - 13.60%
NDF - 63.59%, ADF -55.69%, ADL - 13.1%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 13.47%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

33. Saurauia *roxburghii* (Peho, Tegho)

Saurauia *roxburghii* (Peho) is a perennial tree found in forest of Nagaland (Kohima, Tuensang). It is chatacterised by woody stem, simple and alternate leaf, glomerule inflorescence with pink flower. Leaves are used as feed for pigs by farmers. It is available during autumn and winter season. The plant in the autumn season is found to contain:

Crude protein - 6.61%
NDF - 60.21%, ADF -48.01%, ADL - 9.28%
Analysis of the same plant in winter revealed that it has higher crude protein - 17.65%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 6.88%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

34. Schima *wallichii* (Mecho)

Schima *wallichii* (Mechie) is a perennial tree found in forest of Nagaland (Kohima, Mokokchung). It is characterized by woody stem, simple alternate leaf, glomerule inflorescence with white flower. Young leaves are used as feed for pigs by farmers. It is available mainly during autumn and summer seasons. The plant in the autumn season is found to contain:

Crude protein - 10.56%
NDF - 68.24%, ADF -46.08%, ADL - 10.40%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 14.21%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

35. Spilanthes *acmella* (Houshünha)

Spilanthes *acmella* (Houshünha) is an annual herb found in forest of Nagaland (Kohima, Wokha). It is characterized by fleshy stem, opposite decussate stem, capitulum inflorescence with yellow flower. Leaves stems and flowers are used as feed for pigs by farmers. It is available mainly during autumn season. The plant in the autumn season is found to contain:

Crude protein - 15.18%
NDF - 47.33%, ADF -34.49%, ADL - 5.98%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 2.02%
Cyanogenic glycoside - 0.023%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

36. Strobilanthes *anisophyllus* (Ketsaga)

Strobilanthes *anisophyllus* (Ketsaga) is a perennial herb found in forest of Nagaland (Kohima, Tuensang). It is characterized by simple stem, opposite decussate leaf, recemose inflorescence, purple flower. Leaves are used as feed for pigs by farmers. It is available during autumn and winter seasons. The plant in the autumn season is found to contain:

Crude protein - 21.12%
NDF - 43.07%, ADF -21.19%, ADL - 4.66%
Analysis of the same plant in winter revealed that it has lower crude protein - 16.47%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 1.14%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

37. Thunbergia spp. (Tefüzürie)

Thunbergia spp. (Tefüzürie) is a perennial climber found in forest of Nagaland (Kohima). It is characterized by climbing stem, cordate and opposite leaf, recemose inflorescence with white, tubular flower. Leaves and tender stems are used as feed for pigs by farmers. It is available mainly during autumn season. The plant, in the autumn season is found to contain:

Crude protein - 18.28%
NDF - 57.35%, ADF -44.72%, ADL - 7.89%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 1.86%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

38. Trema *orientalis* (Thedie)

Trema *orientalis* (Thedie) is a perennial tree found in forest of Nagaland (Kohima, Wokha, Mokokchung, Tuensang). It is characterized by woody stem, alternate leaf, glomerule inflorescence with white flower. Leaves are used as feed for pigs by farmers. It is available during autumn and winter seasons. The plant in the autumn season is found to contain:

Crude protein - 20.98%
NDF - 59.42%, ADF -34.46%, ADL - 4.27%
Analysis of the same plant in winter revealed that it has lower crude protein - 13.96%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 2.40%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

39. Urena *lobata* (Küshü, Kouchu)

Urena *lobata* (Küshü) is an annual herb found in forest of Nagaland (Kohima). It is characterized by simple, fibrous stem, lobed and alternate leaf, solitary inflorescence with pink flower. Leaves are used as feed for pigs by farmers. It is available mainly during autumn and summer seasons.The plant in the autumn season is found to contain:

Crude protein - 18.54%
NDF - 62.09%, ADF -51.71%, ADL - 7.91%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 2.10%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

Plants collected from Wokha district

40. Amaranthes *viridis* (Orhyuvo)

Amaranthes *viridis* (Orhyuvo) is an annual herb found in forest of Nagaland (Wokha). It is characterized by simple stem, simple and alternate leaf, catkin inflorescence with green condensed flower. Leaves and tender stems are used as feed for pigs by farmers. It is available mainly during autumn season. The plant, in the autumn season is found to contain:

Crude protein - 24.07%
NDF - 48.04%, ADF -20.88%, ADL - 8.04%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 1.31%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

41. Borreria *articularis* (Palluero)

Borreria *articularis* (Palluero) is an annual herb found in forest of Nagaland (Wokha). It is characterized by quadriangular stem, opposite decussate leaf, verticillaster inflorescence with white flower. Leaves and stem are used as feed for pigs by farmers. It is available mainly during autumn season. The plant, in the autumn season is found to contain:

Crude protein - 16.81%
NDF - 46.87%, ADF -30.85%, ADL - 9.54%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 0.84%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

42. Dioscorea *alata* (Nshaktso)

Dioscorea *alata* (Nshaktso) is an annual climber found in forest of Nagaland (Wokha). It is characterized by climbing stem, cordate and alternate leaf, racemose inflorescence with white flower. Leaves and young stems are used as feed for pigs by farmers. It is available mainly during autumn season. The plant, in the autumn season is found to contain:

Crude protein - 16.57%
NDF - 59.73%, ADF -44.19%, ADL - 5.83%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 2.78%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

43. Diospyros *peregrine* (Mevü)

Diospyros *peregrine* (Mevü) is a perennial tree found in forest of Nagaland (Wokha). It is characterized by woody stem, simple and alternate leaf, cymose inflorescence, white flower and persistent calyx. Leaves are used as feed for pigs by farmers. It is available mainly during autumn season. The plant, in the autumn season is found to contain:

Crude protein - 12.76%
NDF - 59.29%, ADF -43.31%, ADL - 9.47%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 7.97%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

44. Entada *phaseoloides* (Mazuk)

Entada *phaseoloides* (Mazuk) is a perennial climber found in forest of Nagaland (Wokha). It is characterized by fibrous climbing stem, pinnately compound leaf, racemose inflorescence with white flower. Leaves are used as feed for pigs by farmers. It is available during autumn and winter season. The plant, in the autumn season is found to contain:

Crude protein - 15.10%
NDF - 62.75%, ADF -40.21%, ADL - 14.37%
Analysis of the same plant in winter revealed that it has lower crude protein - 9.91%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 3.19%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

45. Ficus *hirta* (Bobo)

Ficus *hirta* (Bobo) is a perennial shrub found in forest of Nagaland (Wokha, Mokokchung). It is characterized by presence of milky latex on stem and leaves, simple stem, lobed leaf, hypanthodium inflorescence with white flower. Leaves are used as feed for pigs by farmers. It is available during autumn as well as winter season. The plant, in the autumn season is found to contain:

Crude protein - 17.47%
NDF - 67.59%, ADF -30.60%, ADL - 9.57%
Analysis of the same plant in winter revealed that it has hither crude protein content-19.05%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 1.94%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

46. Ficus *prostrata* (Thungkyo)

Ficus *prostrata* (Thungkyo) is a perennial tree found in forest of Nagaland (Wokha). It is characterized by woody stem, simple and alternate leaf, hypanthodium inflorescence with pink flower. Leaves are used as feed for pigs by farmers. It is available during autumn season. The plant in the autumn season is found to contain:

Crude protein - 15.79%
NDF - 51.51%, ADF -29.04%, ADL - 10.41%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 0.59%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

47. Galinsoga *parviflora* (Rothan)

Galinsoga *parviflora* (Rothan) is an annual herb found in Nagaland (Wokha). It is characterized by herbaceous stem, simple and opposite flower, capitulum inflorescence with white and yellow flower. Leaves and stems are used as feed for pigs by farmers. It is available during autumn season. The plant, in the autumn season is found to contain:

Crude protein - 20.99%
NDF - 54.73%, ADF -38.94%, ADL - 5.48%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 1.40%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

48. Mussaenda *pubescens* (Worosuthan)

Mussaenda *pubescens* (Worosuthan) is a perennial shrub found in forest of Nagaland (Wokha). It is characterized by woody stem, opposite decussate leaf, cymose inflorescence, yellow flower, Sepal modified into large leaf like structure which is white in colour. Leaves are used as feed for pigs by farmers. It is available mainly during autumn season. The plant, in the autumn season is found to contain:

Crude protein - 11.62%
NDF - 64.62%, ADF -33.19%, ADL - 9.01%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 3.38%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

49. Pouzolzia *hirta* (Shoro)

Pouzolzia *hirta* (Shoro) is an annual herb found in forest of Nagaland (Wokha). It is characterized by herbaceous stem, opposite leaf, varticillaster inflorescence with condensed, white flower. Leaves and stems are used as feed for pigs by farmers. It is available mainly during autumn season. The plant, in the autumn season is found to contain:

Crude protein - 14.88%
NDF - 58.79%, ADF -37.80%, ADL - 10.53%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 1.74%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

50. Pouzolzia spp. (Ninam)

Pouzolzia spp. (Ninam) is a perennial subshrub found in forest of Nagaland (Wokha, Tuensang). It is characterized by suffrutescent stem, simple and alternate leaf, Verticillester inflorescence with condensed white flower. Leaves and young stems are used as feed for pigs by farmers. It is available mainly during autumn season. The plant, in the autumn season is found to contain:

Crude protein - 19.44%
NDF - 60.57%, ADF -44.69%, ADL - 5.80%
Analysis of the same plant in winter revealed that it has higher crude protein content-25.88%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 1.07%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

51.Strobilanthes *bocrharioides* (Khongungpen)

Strobilanthes *bocrharioides* (Khongungpen) is a perennial herb found in forest of Nagaland (Wokha). It is characterized by herbaceous stem, opposite decussate leaf which are maroon in colour at the back, racemose inflorescence with purple flower. Leaves and young stems are used as feed for pigs by farmers. It is available during autumn and winter season. The plant, in the autumn season is found to contain:

Crude protein - 10.36%
NDF - 43.07%, ADF -32.59%, ADL - 4.01%
Analysis of the same plant in winter revealed that it has higher crude protein - 25.29%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 0.73%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

52. Terminalia myriocarpa (Eva)

Terminalia myriocarpa (Eva) is a perennial tree found in the forest of Nagaland (Wokha, Tuensang). It is characterized by woody and erect stem, alternate leaf, racemose inflorescence with tiny, white flower. Leaves are used as feed for pigs by farmers. It is available mainly during autumn season. The plant, in the autumn season is found to contain:

Crude protein - 8.79%
NDF - 47.20%, ADF -33.24%, ADL - 8.65%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 31.46%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

Plants collected from Mokokchung district

53. Ageratum *conyzoides* (Tsümaryi)

Ageratum *conyzoides* (Tsümaryi) is an annual herb found in Nagaland (Mokokchung). It is characterized by herbaceous stem, opposite decussate leaf, capitulum inflorescence with bluish flower. Leaves and young stem are used as feed for pigs by farmers. It is available mainly during autumn season. The plant, in the autumn season is found to contain:

Crude protein - 18.94%
NDF - 48.69%, ADF -35.21%, ADL - 6.35%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 2.64%
(See Annex - I for taxonomical classification and Annex - II for chemical

54. Allophylus *zeylanicus* (Sungkumww)

Allophylus *zeylanicus* (Sungkumwa) is a perennial tree found on forest of Nagaland (Mokokchung). It is characterized by woody stem, alternate leaf, racemose inflorescence with white flower. Leaves are used as feed for pigs by farmers. It is available mainly during autumn season. The plant, in the autumn season is found to contain:

Crude protein - 14.02%
NDF - 67.62%, ADF -50.74%, ADL - 11.40%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 2.49%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

55. Clerodendrum *serratum* (Entsuklawa)

Clerodendrum *serratum* (Entsuklawa) is a perennial shrub found in forest of Nagaland (Mokokchung). It is characterized by woody stem, oppositely decussate lesf, cymose inflorescence with white flower. Leaves are used as feed for pigs by farmers. It is available mainly during autumn season. The plant, in the autumn season is found to contain:

Crude protein - 15.69%
NDF - 44.99%, ADF -33.57%, ADL - 4.58%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 4.44%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

56. Costus *speciosus* (Kezuengti)

Costus *speciosus* (Kezuengti) is an annual rhizomatous herb found in forwst of Nagaland (Mokokchung, Tuensang). It is characterized by presence of fibrous, rhizomatous stem, whorled leaf, raceme inflorescence with white flower and red bracts. Leaves are used as feed for pigs by farmers. It is available mainly during autumn season. The plant, in the autumn season is found to contain:

Crude protein - 15.95%
NDF - 68.96%, ADF -42.56%, ADL - 9.22%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 1.76%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

57. Elatostema *lineolatum* (Longsuwa)

Elatostema *lineolatum* (Longsuwa) is an annual herb found in forest of Nagaland (Mokokchung, Tuensang). It is characterized by succulent stem, alternate leaf, capitulum inflorescence with condensed, white flower. Leaves and stems are used as feed for pigs by farmers. It is available during autumn and winter season. The plant, in the autumn season is found to contain:

Crude protein - 11.22%
NDF - 49.81%, ADF -35.30%, ADL - 10.41%
Analysis of the same plant in winter revealed that it has higher crude protein - 23.04%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 0.65%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

58. Fagopyrum *esculentum* (Tobaccowa)

Fagopyrum *esculentum* (Tobaccowa) is an annual herb found in forest of Nagaland (Mokokchung). It is characterized by hollow, herbaceous stem, cordate and alternate leaf, racemose inflorescence with white flower. Leaves and stems are used as feed for pigs by farmers. It is available during autumn and winter season. The plant, in the autumn season is found to contain:

Crude protein - 20.95%
NDF - 57.80%, ADF -42.96%, ADL - 5.91%
Analysis of the same plant in winter revealed that it has lower crude protein - 16.52%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 6.34%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

59. Ficus *auriculata* (Shimongo)

Ficus *auriculata* (Shimongo) is a perennial tree found in forest of Nagaland (Mokokchung). It is characterized by presence of milky latex on stem and leaf, woody stem, large cordate leaf and hypenthodium inflorescence with pink flower. Leaves are used as feed for pigs by farmers. It is available during autumn and winter season. The plant, in the autumn season is found to contain:

Crude protein - 9.73%
NDF - 63.98%, ADF -48.32%, ADL - 13.66%
Analysis of the same plant in winter revealed that it has higher crude protein - 15.93%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 3.91%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

60. Ficus *globosa* (Ayongtu)

Ficus *globosa* (Ayongtu) is a perennial tree found in forest of Nagaland (Mokokchung). It is characterized by woody stem, alternate leaf, hupenthodium inflorescence with pink flower. Leaves are used as feed for pigs by farmers. It is available mainly during autumn season. The plant, in the autumn season is found to contain:

Crude protein - 11.53%
NDF - 66.81%, ADF -50.01%, ADL - 14.18%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 3.31%
Cyanogenic glycoside-0.054%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

61. Ficus *semicordata* (Koruwa)

Ficus *semicordata* (Koruwa) is a perennial tree found in forest of Nagaland (Mokokchung). It is characterized by woody stem, semi-cordate and alternate leaf, hypenthodium inflorescence with pink flower and presence of milky latex. Leaves are used as fodder by farmers. It is available during autumn and winter season. The plant, in the autumn season is found to contain:

Crude protein - 16.66%
NDF - 58.65%, ADF -44.25%, ADL - 8.24%
Analysis of the same plant in winter revealed that it has higher crude protein - 17.44%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 0.62%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

62. Ficus spp. (Atsubemjang)

Ficus spp. (Atsubemjang) is a perennial tree found in forest of Nagaland (Mokokchung, Tuensang). It is characterized by woody stem, simple and alternate leaf, hypenthodium inflorescence with pink flower. Leaves are used as fodder by fermers. It is available mainly during autumn season. The plant, in the autumn season is found to contain:

Crude protein - 14.18%
NDF - 56.50%, ADF -44.20%, ADL - 13.08%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 11.74%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

63. Forrestia *mollissima* (Jangpangjemwa)

Forrestia *mollissima* (Jangpangjemwa) is a perennial herb found in forest of Nagaland (Mokokchung). It is characterized by fleshy stem, broad and alternate leaf, raceme inflorescence with yellow flower. Leaves are used as fodder by farmers. It is available during autumn and winter season. The plant, in the autumn season is found to contain:

Crude protein - 14.21%
NDF - 64.53%, ADF -43.69%, ADL - 10.79%
Analysis of the same plant in winter revealed that it has higher crude protein - 16.09%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 1.47%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

64. Justicia spp. (Yongkumwa)

Justicia spp. (Yongkumwa) is a perennial sub-shrub found in forest of Nagaland (Mokokchung). It is characterized by woody stem, simple and opposite leaf, raceme inflorescence with white flower. Leaves are used as feed for pigs by farmers. It is available mainly during autumn season. The plant in autumn season is found to contain:

Crude protein 14.03%
NDF - 36.40%, ADF -26.82%, ADL - 6.93%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 3.56%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

65. Magnolia *pterocarpa* (Nokpangtiben)

Magnolia *pterocarpa* (Nokpangtiben) is a perennial tree found in forest of Nagaland (Mokokchung). It is characterized by woody stem, alternate leaf, solitary inflorescence with white bracts. Leaves are used as feed for pigs by farmers. It is available mainly during autumn season. The plant in autumn season is found to contain:

Crude protein - 12.01%
NDF - 67.64%, ADF -54.23%, ADL - 12.68%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 4.37%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

66. Peristrophe *tinctoria* (Chanilawa)

Peristrophe *tinctoria* (Chanilawa) is an annual hern found in forest of Nagaland (Mokokchung). It is characterized by herbaceous stem, opposite decussate leaf, solitary inflorescence with yellow flower. Leaves and stems are used as feed for pigs by farmers. It is available mainly during autumn season. The plant, in the autumn season is found to contain:

Crude protein - 19.84%
NDF - 45.18%, ADF -34.84%, ADL - 3.27%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 1.33%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

67. Sarcochlamys *pulcherrima* (Natsulawa)

Sarcochlamys *pulcherrima* (Natsulawa) is a perennial sub-shrub found in forest of Nagaland (Mokokchung). It is characterized by fleshy, angular stem, elongated and alternate leaf, catkin inflorescence with condensed, whitish flower. Leaves and tender stems are used as feed for pigs by farmers. It is available during autumn and winter season. The plant, in the autumn season is found to contain:

Crude protein 15.04%
NDF - 54.75%, ADF -35.21%, ADL - 7.74%
Analysis of the same plant in winter revealed that it has lower crude protein - 14.98%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 2.20%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

68. Saurauia spp. (Atsutsula)

Saurauia spp. (Atsutsula) is a perennial tree found in Nagaland (Mokokchung). It is characterized by woody stem, simple and alternate leaf, cymose inflorescence with pink flower. Leaves are used as feed for pigs by farmers. It is available mainly during autumn season. The plant, in autumn season is found to contain:

Crude protein - 16.05%
NDF - 63.85%, ADF -53.11%, ADL - 5.49%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 2.48%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

69. Urtica spp. (Kongjemlawa)

Urtica spp. (Kongjemlawa) is a perennial sub-shrub found in Nagaland (Kohima, Tuensang). The plant is characterized by simple stem, alternate leaf, catkin inflorescence with condensed, white flower. Leaves are used as feed for pigs by farmers. It is available mainly during autumn season. The plant in autumn season is found to contain:

Crude protein - 18.47%
NDF - 57.59%, ADF -39.08%, ADL - 12.18%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 1.45%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

Plants collected from Tuensang district

70. Abelmoschusspp.(Shimathung)

Abelmoschus spp. (Shimathung) is an annual sub-shrub found in Nagaland (Tuensang). The plant is characterized by simple stem, lobed and alternate leaf, solitary inflorescence with yellow flower. Leaves are used as feed for pigs by farmers. It is available mainly during autumn season. The plant in autumn season is found to contain:
Crude protein - 27.01%
NDF - 59.56%, ADF -24.03%, ADL - 5.95%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 2.24%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

71. Achyranthes *aspera* (Lühnuk)

Achyranthes *aspera* (Lühnuk) is an annual herb found in Nagaland (Tuensang). The plant is characterized by herbaceous stem, simple and opposite leaf, racemose inflorescence with greenish flower. Leaves and stems are used as feed for pigs by farmers. It is available mainly during autumn season. The plant in autumn season is found to contain:

Crude protein - 11.41%
NDF - 65.92%, ADF -49.99%, ADL - 9.73%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 2.97%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

72. Begonia *palmata* (Amppishik)

Begonia *palmata* (Amppishik) is an annual herb found in Nagaland (Tuensang). The plant is characterized by succelent stem, palmate leaf with elongated petiole, cymose inflorescence with white flower. Leaves and stems and petioles are used as feed for pigs by farmers. It is available during autumn and winter season. The plant,in the autumn season is found to contain:

Crude protein - 15.02%
NDF - 68.62%, ADF -53.15%, ADL - 10.84%
Analysis of the same plant in winter revealed that it has higher crude protein - 21.41%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 2.50%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

73. Colocasia *esculanta* (Ukchet)

Colocasia *esculanta* (Ukchet) is a rhizomatous herb found in forest of Nagaland (Tuensang). It is characterized by stem which is modified into root stock, petiolate leaf, spadix inflorescence with white flower. Leaves and petioles are used as feed for pigs by farmers. It is available mostly during autumn season. The plant in the autumn season is found to contain:

Crude protein - 18.45%
NDF - 62.32%, ADF -34.15%, ADL - 7.31%
Tests for anti-nutritional factors showed that it has total phenolic componds-2.20%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

74. Debregeasia *longifolia* (Lekem)

Debregeasia *longifolia* (Lekem) is a perennial shrub found in Nagaland (Tuensang). The plant is characterized by woody stem, alternate leaf, catkin inflorescence with condensed, white flower. Leaves are used as feed for pigs by farmers. It is available mainly during autumn season. The plant in the autumn season is found to contain:

Crude protein - 19.15%
NDF - 62.60%, ADF -45.51%, ADL - 8.48%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 2.52%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

75. Ficus *spp.* (Poklüh)

Ficus *spp.* (Poklüh) is a perennial climber found in Nagaland (Tuensang). The plant is characterized by woody stem, broad and alternate leaf, hypenthodium inflorescence with white flower. Leaves are used as feed for pigs by farmers. It is available mainly during autumn season. The plant in the autumn season is found to contain:

Crude protein - 16.74%
NDF - 46.33%, ADF -37.79%, ADL - 10.77%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 1.39%
(See Annex - I for taxonomical classification and Annex - II for chemical composition

76. Gynura spp. (Konglong)

Gynura spp. (Konglong) is an annual herb found in Nagaland (Tuensang). It is characterized by herbaceous stem, alternate leaf, capitulum inflorescence with white flower. Leaves are used as fodder by farmers. It is available mainly during autumn season. The plant in the autumn season is found to contain:

Crude protein 15.09%
NDF - 69.82%, ADF -53.23%, ADL - 11.62%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 1.49%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

77. Impatiens *falcifer* (Lükpok)

Impatiens *falcifer* (Lükpok) is an annual herb found in forest of Nagaland (Tuensang). It is characterized by succulent stem, simple and alternate leaf, solitary inflorescence with whitish pink flower. Leaves and stems are used as feed for pigs farmers. It is available mainly during autumn season. The plant, in the autumn season is found to contain:

Crude protein - 20.90%
NDF - 62.21%, ADF -31.11%, ADL - 5.98%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 3.00%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

78. Justicia *procumbens* (Nemrum)

Justicia *procumbens* (Nemrum) is an annual herb found in Nagaland (Tuensang). It is characterized by herbaceous stem, alternate leaf, racemose inflorescence with purplish white flower. Leaves are used as fodder by farmers. It is available mainly during autumn season. The plant in the autumn season is found to contain:

Crude protein - 15.53%
NDF - 58.19%, ADF -35.37%, ADL - 5.77%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 1.31%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

79. Justicia *versiculos* (Shisha)

Justicia versiculos (Shisha) is a perennial herb found in Nagaland (Tuensang). It is characterized by herbaceous stem, alternate leaf, racemose inflorescence with white flower. Leaves are used as feed for pigs by farmers. It is available during autumn and winter season. The plant in the autumn season is found to contain:

Crude protein - 18.42%
NDF - 53.89%, ADF -35.87%, ADL - 4.03%
Analysis of the same plant in winter revealed that it has higher crude protein - 23.64%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 3.10%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

80. Momordica spp. (Khumshung)

Momordica spp. (Khumshung) is an annual climber found in Nagaland (Tuensang). It is characterized by climbing stem, cordate leaf, solitary inflorescence with white flower. Leaves are used as feed for pigs by farmers. It is available mainly during autumn season. The plant in the autumn season is found to contain:

Crude protein 22.12%
NDF - 57.44%, ADF -33.45%, ADL - 7.35%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 2.35%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

81. Oxyspora *paniculata* (Auchipen)

Oxyspora *paniculata* (Auchipen) is a perennial sub-shrub found in Nagaland (Tuensang). It is characterized by woody stem, oppositely decussate leaf, racemose inflorescence with pink flower. Leaves are used as feed for pigs by farmers. It is available mainly during autumn season. The plant in the autumn season is found to contain:

Crude protein - 11.33%
NDF - 39.14%, ADF -22.57%, ADL - 7.19%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 29.68%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

82. Pilea *ambrosia* (Hakshoushik)

Pilea *ambrosia* (Hakshoushik) is an annual herb found in forest of Nagaland (Tuensang). It is characterized by succulent stem, simple and opposite decussate leaf, raceme inflorescence with condensed white flower. Leaves and stems are used as feed for pigs by farmers. It is available mainly during autumn season. The plant, in the autumn season is found to contain:

Crude protein - 15.70%
NDF - 48.67%, ADF -38.82%, ADL - 8.33%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 1.02%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

83. Plantago *major* (Sangpongshik)

Plantago *major* (Sangpongshik) is an annual herb found in forest of Nagaland (Tuensang). It is characterized by reduced stem, simple and opposite decussate leaf with elongated petiole, racemose inflorescence with white flower. Leaves, stems and petiole are used as feed for pigs farmers. It is available mainly during autumn season. The plant, in the autumn season is found to contain:

Crude protein - 14.87%
NDF - 58.36%, ADF -47.89%, ADL - 5.83%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 2.07%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

84. Porana *racemosa* (Hanjülüh)

Porana *racemosa* (Hanjülüh) is an annual climber found in Nagaland (Tuensang). It is characterized by climbing stem, cordate and alternate leaf, racemose inflorescence with white flower. Leaves are used as feed for pigs by farmers. It is available mainly during autumn season. The plant in the autumn season is found to contain:

Crude protein - 11.01%
NDF - 68.86%, ADF -51.08%, ADL - 10.36%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 5.06%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

85. Pouzolzia *sanguinea* (Konya)

Pouzolzia *sanguinea* (Konya) is a perennial sub-shrub found in Nagaland (Tuensang). The plant is characterized by woody stem, alternate leaf, capitulum inflorescence with condensed, white flower. Leaves are used as feed for pigs by farmers. It is available during autumn and winter season. The plant in the autumn season is found to contain:

Crude protein - 9.66%
NDF - 52.90%, ADF -36.49%, ADL - 7.97%
Analysis of the same plant in winter revealed that it has higher crude protein - 22.05%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 0.94%
(See Annex - I for taxonomical classification and Annex - II for chemical composition

86. Pouzolzia spp. (Shishahanbou)

Pouzolzia spp. (Shishahanbou) is an herb found in Nagaland (Tuensang). The plant is characterized by herbaceous stem, opposite decussate leaf, racemose inflorescence with white flower. Leaves are used as feed for pigs by farmers. It is available mainly during autumn season. The plant, in the autumn season is found to contain:

Crude protein - 18.24%
NDF - 57.12%, ADF -40.63%, ADL - 6.09%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 2.25%
(See Annex - I for taxonomical classification and Annex - II for chemical composition

87. Saurauia *punduana* (Lamagmanak)

Saurauia *punduana* (Lamagmanak) is a perennial shrub found in Nagaland (Tuensang). It is characterized by woody stem, simple and alternate leaf, cymose inflorescence with pink flower. Leaves are used as feed for pigs by farmers. It is available during autumn and winter season. The plant, in the autumn season is found to contain:

Crude protein - 13.79%
NDF - 65.69%, ADF -56.49%, ADL - 15.10%
Analysis of the same plant in winter revealed that it has higher crude protein - 15.13%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 1.84%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

88. Strobilanthes *callosus* (Shishakhükpok)

Strobilanthes *callosus* (Shishakhükpok) is a perennial herb found in Nagaland (Tuensang). It is characterized by herbaceous stem, alternate leaf, racemose inflorescence with whitish purple flower. Leaves are used as feed for pigs by farmers. It is available mainly during autumn season. The plant in the autumn season is found to contain:

Crude protein - 11.38%
NDF - 43.55%, ADF -31.18%, ADL - 7.13%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 3.98%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

89. Tetrastigma *serrulatum* (Semlühek)

Tetrastigma *serrulatum* (Semlühek) is an annual climber found in Nagaland (Tuensang). It is characterized by climbing stem, palmately compound leaf, cymose inflorescence with white flower. Leaves are used as feed for pigs by farmers. It is available mainly during autumn season. The plant in the autumn season is found to contain:

Crude protein - 17.28%
NDF - 54.05%, ADF -34.23%, ADL - 3.37%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 1.58%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

90. Trichosanthes *anguina* (Lühshik)

Trichosanthes *anguina* (Lühshik) is an annual climber found in Nagaland (Tuensang). It is characterized by climbing, angular stem, lobed leaf, solitary inflorescence with white flower. Leaves are used as feed for pigs by farmers. It is available mainly during autumn season. The plant in the autumn season is found to contain:

Crude protein - 15.63%
NDF - 62.01%, ADF -48.91%, ADL - 8.75%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 2.58%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

91. Turpinia *pomifera* (Leikung)

Turpinia *pomifera* (Leikung) is a perennial tree found in Nagaland (Tuensang). It is characterized by woody stem, palmate leaf, racemose inflorescence with white flower. Leaves are used as feed for pigs by farmers. It is available during autumn and winter season. The plant, in the autumn season is found to contain:
Crude protein - 13.63%
NDF - 51.65%, ADF -33.90%, ADL - 7.51%
Analysis of the same plant in winter revealed that it has lower crude protein - 10.46%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 10.61%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

92. Vitis *capensis* (Nguhrülu)

Vitis *capensis* (Nguhrülu) is an annual climber found in Nagaland (Tuensang). It is characterized by climbing stem, palmately compound leaf, cymose inflorescence with white flower. Leaves are used as feed for pigs by farmers. It is available mainly during autumn season. The plant in the autumn season is found to contain:

Crude protein - 18.14%
NDF - 55.94%, ADF -40.97%, ADL - 7.39%
Tests for anti-nutritional factors showed that it has total phenolic compounds - 1.58%
Cyanogenic glycoside-0.003%
(See Annex - I for taxonomical classification and Annex - II for chemical composition)

Annex - 1. Taxonomic classification of forest based fodders found in different districts

1. Fodders collected from Kohima district

	Taxonomy			
Local name	Family	Genus	Species	Habit
Mezha	Euphorbaceae	Alchornea	A. *Cordifolia*	Shrub
Papanrü	Amaranthaceae	Alternanthera	A. *sessilis*	Herb
Gathula	Polypodaceae	Angiopteris	Spp.	Fern
Tenrutsüthu	Asteraceae	Bidens	B. *pilosa*	Herb
Lovie	Urticaceae	Boehmeria	B. *platyphylla*	Sub-shrub
Gatherü	Verbenaceae	Clerodendrum	C. *colebrookianum*	Shrub
Zürü	Araceae	Colocasia	Spp.	Herb
Theüprü	Commelinaceae	Commelina	C. *benghalensis*	Herb
Therüprü	Commelinaceae	Commelina	C. *obliqua*	Herb
Füfü	Zingeberaceae	Curcuma	C. *montana*	Herb
Kiphie	Dioscoreaceae	Dioscorea	D. *pentaphylla*	Climber
Zielhounrü	Urticaceae	Elatostema	E. *disssectum*	Herb
Süta	Asteraceae	Erigeron	E. *bonariensis*	Herb
Hieto	Fabaceae	Erythrina	E. *variegata*	Tree
Temichede	Moraceae	Ficus	F. *hispida*	Tree
Thogwü	Verbenaceae	Gmelina	G. *arborea*	Tree
Tephrie Nhasa	Asteraceae	Gynura	G. *crepidioides*	Herb
Keko	Asteraceae	Gynura	G. *cusimbua*	Herb
Tsiekie	Balsaminaceae	Impatiens	Spp.	Herb
Ketsasi	Malvaceae	Kydia	K. *calcycina*	Tree
Lovie	Urticaceae	Laportia	Spp.	Sub-shrub
Huru	Leeaceae	Leea	L. *sambucina*	Shrub
Kerienha	Asteraceae	Mikania	M. *cordata*	Climber
Terhobiepou	Rubiaceae	Mussaenda	M. *pubescens*	Shrub
Gakra	Apiaceae	Oenanthe	O. *javanica*	Herb
Khukhie	Melastomaceae	Osbeckia	O. *capitata*	Shrub
Gati	Urticaceae	Pilea	P. *senipta*	Herb
Gare	Polygonaceae	Polygonum	P. *chinenses*	Fern

	Taxonomy			
Local name	Family	Genus	Species	Habit
Chüsiga	Polygonaceae	Polygonum	P. *hydropiper*	Herb
Prügi	Polygonaceae	Polygonum	P. *runcinatum*	Herb
Yedu	Urticaceae	Pouzolzia	P. *viminea*	Shrub
Tsomhu	Anacardiaceae	Rhus	R. *semialata*	Herb
Peho	Actinidiaceae	Saurauia	S. *roxburghii*	Herb
Mechie	Theaceae	Schima	S.*wallichii*	Herb
Houshünha	Asteraceae	Spilanthes	S. *acmella*	Herb
Ketsanha	Acanthaceae	Strobilanthes	S. *anisophyllus*	Climber
Tefüzürie	Acanthaceae	Thunbergia	Spp.	Herb
Thedie	Ulmaceae	Trema	T. *orientalis*	Herb
Kushü	Malvaceae	Urena	U. *lobata*	Tree

2. Fodders collected from Wokha district

Local name	Family	Genus	Species	Habit
Orhyuwo	Amaranthaceae	Amaranthes	A. *viridis*	Herb
Pyravo	Asteraceae	Bidens	B. *pilosa*	Herb
Palluero	Rubiaceae	Borreria	B. *articularis*	Herb
Nshaktso	Dioscoreaceae	Dioscorea	D. *alata*	Climber
Mevu	Ebenaceae	Diospyros	D. *peregrina*	Tree
Mazuk	Fabaceae	Entada	E. *phaseolides*	Climber
Bobo	Moraceae	Ficus	F. *hirta*	Shrub
Thungkyo	Moraceae	Ficus	F. *prostrata*	Tree
Rothan	Asteraceae	Galinsoga	G. *parviflora*	Herb
Hanphyan	Asteraceae	Gynura	G. *crepidiodes*	Herb
Chunglong	Leeaceae	Leea	L. *sambucina*	Shrub
Worosuthan	Rubiaceae	Mussaenda	M. *pubescens*	Shrub
Mangsu temaro	Melastomaceae	Osbeckia	O. *capitata*	Shrub
Shoro	Urticaceae	Pouzolzia	P. *hirta*	Herb
Ninam	Urticaceae	Pouzolzia	Spp.	Herb
Thungbak	Anacardiaceae	Rhus	R. *semialata*	Tree
Orajak	Asteraceae	Spilanthes	S. *acmella*	Herb
Khongungpen	Acanthaceae	Strobilanthes	S. *bocrharioides*	Herb
Eva	Dipterocarpaceae	Terminalia	T. *myriocarpa*	Tree

3. Fodders collected from Mokokchung district

Local name	Taxonomy			Habit
	Family	Genus	Species	
Tsümaryi	Asteraceae	Ageratum	A. *conyzoides*	Herb
Sungkumwa	Sapindaceae	Allophyllus	A. *zeylanicus*	Tree
Kumunatsutu	Asteraceae	Bidens	B. *pilosa*	Herb
Eining	Rubiaceae	Borreria	B. *articularis*	Herb
Entsuklawa	Verbanaceae	Clerodendrum	C. *serratum*	Shrub
Kezuengti	Costaceae	Costus	C. *speciosus*	Herb
Longsuwa	Urticaceae	Elatostema	E. *lineolatum*	Herb
Tobaccowa	Polygonaceae	Fagopyrum	P. *esculentum*	Herb
Shimongo	Moraceae	Ficus	F. *auriculata*	Tree
Ayongtu	Moraceae	Ficus	F. *globosa*	Tree
Pangsemwa	Moraceae	Ficus	F. *hispida*	Tree
Koruwa	Moraceae	Ficus	F. *semicordata*	Tree
Atsubemjang	Moraceae	Ficus	Spp.	Tree
Jangpangjemwa	Commelinaceae	Forrestia	F. *mollissima*	Herb
Awa	Verbenaceae	Gmelina	G. *arborea*	Tree
Manglibaza	Asteraceae	Gynura	G. *crepidioides*	Herb
Yongbangza	Acanthaceae	Justicia	J. *versiculosa*	Herb
Yongkumwa	Acanthaceae	Justicia	Spp.	Sub-shrub
Nokpangtiben	Magnoliaceae	Magnolia	M. *pterocarpa*	Tree
Chinaza	Asteraceae	Mikania	M. *cordata*	Climber
Indipiwa	Rubiaceae	Mussaenda	M. *pubescens*	Shrub
Indipiwa	Rubiaceae	Mussaenda	M. *frondosa*	Shrub
Lamlawa	Melastomaceae	Osbeckia	O. *capitata*	Sub-shrub
Chanilawa	Acanthaceae	Peristrophe	P. *tinctoria*	Herb
Yangruwa	Polygonaceae	Polygonum	P. *chinense*	Herb
Natsulawa	Urticaceae	Sarcochlamys	S. *pulcherrima*	Sub-shrub
Atsutsula	Actinidiaceae	Saurauia	Spp.	Tree
Mechangwa	Theaceae	Schima	S. *wallichii*	Tree
Süngjemwa	Acanthaceae	Strobilanthes	S. *anisophyllus*	Herb
Kongjemlawa	Urticaceae	Urtica	Spp.	Sub-shrub

4. Fodders collected from Tuensang district

Local name	Taxonomy			Habit
	Family	Genus	Species	
Shimathung	Malvaceae	Abelmoschus		Sub-shrub
Lühnak	Amaranthaceae	Achyranthes	*A. aspera*	Herb
Amppishik	Bagoniaceae	Begonia	P. *palmata*	Herb
Shisha	Urticaceae	Boehmeria	B. *platyphylla*	Sub-shrub
Ukchet	Araceae	Colocasia	C. *esculenta*	Herb
Deitang	Costaceae	Costus	C. *speciosus*	Herb
Lekem	Urticaceae	Debregeasia	D. *longifolia*	Shrub
Manak	Urticaceae	Elatostoma	E. *linoelatum*	Herb
Khabasu	Moraceae	Ficus	F. *auriculata*	Tree
Poklüh	Moraceae	Ficus	Spp.	Climber
Lühkong	Moraceae	Ficus	Spp.	Tree
Konglong	Asteraceae	Gynura	Spp.	Herb
Lükpong	Balsaminaceae	Impatiens	I. *falcifer*	Herb
Kenyakjam	Balsaminaceae	Impatiens	spp.	Herb
Nemrüm	Acanthaceae	Jucticia	J. *procumbens*	Herb
Shisha	Acanthaceae	Justicia	J. *versiculosa*	Herb
Thungkong	Leeaceae	Leea	L. *sambucina*	Shrub
Khumsüng	Cucurbitaceae	Momordica	Spp.	Climber
Aubothokchi	Rubiaceae	Mussaenda	M. *frondosa*	Shrub
Auchipen	Melastomaceae	Oxyspora	O. *paniculata*	Sub-shrub
Hakshoushik	Urticaceae	Pilea	P. *ambrosia*	Herb
Sangpongshik	Plantaginaceae	Plantago	P. *major*	Herb
Lilipung	Polygonaceae	Polygonum	P. *chinense*	Herb
Lilipung	Polygonaceae	Polygonum	P. *runcinatum*	Herb
Hanjulüh	Convolvulaceae	Porana	P. *racemosa*	Climber
Lomoushik	Urticaceae	Pouzolzia	P. *hirta*	Herb
Konya	Urticaceae	Pouzolzia	P. *sanguinea*	Sub-shrub
Shishahanbou	Urticacese	Pouzolzia	Spp.	Herb
Sangilenlekhin	Urticacese	Pouzolzia	P. *vininea*	Herb
Lamangmanak	Actinidiaceae	Saurauia	S. *punduana*	Shrub
Hausang	Asteraceae	Spilanthes	S. *acmella*	Herb
Khüzüjam	Acanthaceae	Strobilanthes	S. *anisophyllus*	Herb
Shishakhükpok	Acanthaceae	Strobilanthes	S. *callosus*	Herb
Lek	Dipterocarpaceae	Terminalia	T. *myriocarpa*	Tree

Local name	Taxonomy			Habit
	Family	Genus	Species	
Kebuik	Ulmaceae	Trema	T. *orientalis*	Tree
Lühshik	Cucurbitaceae	Trichosanthes	T. *anguina*	Climber
Leikung	Staphyleaceae	Turpinia	T. *pomifera*	Tree
Shishapu	Urticaceae	Urtica	Spp.	Sub-shrub
Nguhrülu	Vitaceae	Vitis	V. *capensis*	Climber

Annex - II. Chemical composition of forest based fodders collected from different districts

Kohima district

	DM%		CP (%)		NDF (%)		ADF (%)		ADL (%)		Ash (%)		Phenol (Gallic Acid Equivalent) (%)	Cyanogenic glycoside (%)
Wild forages	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2	Round 1	Round 1
Mezha	26.66		15.50		66.57		50.81		7.21*		6.14		1.12	-
Papanrü	13.43		21.38		47.34		24.74		3.60*		17.96		2.204	-
Gathula	21.56		18.23		60.29		58.96		7.45*		11.23		2.16	-
Tenrütsüthu	11.53		17.60		56.33		45.32		4.89*		18.02		3.70	-
Lovie	16.12		22.8		53.32		52.86		5.87*		15.30		1.61	-
Gatherü	31.51		29.97		61.81		47.83		4.48*		8.42		1.07	-
Zürü	9.09		13.63		60.31		40.83		6.02*		17.62		1.33	-
Theüprü	12.22		14.23		57.35		54.72		5.80*		15.54		2.20	-
Therüprü	12.76	8.99	11.53	21.30*	57.83	47.88*	49.27	35.30*	5.69*	5.17*	18.41	16.60*	4.24	-
Füfü	18.40		16.92		68.87		33.80		3.15*		10.75		5.64	-
Kiphie	22.54		18.47		50.70		47.76		5.25*		13.84		1.97	-

*-NIRS (values are blind predicted using an existing mixed crop model and hence likely to have less accuracy)

	DM%		CP(%)		NDF (%)		ADF (%)		ADL (%)		Ash (%)		Phenol (Gallic Acid) Equiva-lent (%)	Cyanogenic glycoside (%)
	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2	Round 1	Round 1
Zielhounrü	11.36		19.58		44.31		57.86		5.18*		29.86		1.25	-
Süta	17.62		23.78		57.62		38.41		5.09*		10.13		2.70	-
Hieto	23.62		24.16		57.72		36.12		5.83*		6.96		5.02	-
Thogwü	18.78		18.56		56.54		38.58		9.02*		10.00		5.33	0.059
Tephrie-Nhasa	10.81		28.58		47.17		48.50		5.47*		24.90		1.43	-
Keko	6.06		14.17		48.31		38.08		6.05*		20.67		1.09	-
Tsiekie	9.09		24.14		63.19		66.00		6.29*		15.59		2.36	-
Ketsasi	21.93		17.16		66.96		53.98		7.38*		12.54		2.96	-
Lovie	11.11		24.2		53.39		45.83		4.81*		21.60		1.20	-
Huru	18.20		12.94		53.67		5.88		7.99*		12.27		1.02	-
Kerienha	9.09		14.44		55.68		32.30		5.53*		7.04		1.34	-
Terhobiepou	23.80		14.36		62.55		36.60		7.07*		10.07		4.94	-
Gakra	8.33		18.42		42.48		46.97		4.69*		30.34		1.43	-
Khukhie	23.33	19.98	10.72	19.23*	55.31	53.92*	36.42	34.08*	7.89*	7.97*	8.80	10.64*	7.21	-
Gati	10.00		23.26		51.31		59.65		5.25*		28.20		1.74	--
Gare	18.42	19.02	11.26	15.15*	62.29	55.71*	38.21	31.20*	10.9*	10.7*	7.79	1.88*	1.25	-
Chüsiga	12.90		18.85		67.65		54.42		8.06*		11.17		8.47	-
Prügi	10.00		18.11		67.47		39.41		6.27*		15.79		7.51	-
Yedu	20.58		15.04		80.79		50.74		7.74*		12.48		2.71	-
Tsomhu	30.00		13.60		73.59		65.69		13.1*		5.05		13.47	-
Peho	20.12	16.94	6.61	17.65*	70.21	50.97*	48.01	25.14*	9.28*	8.63*	12.00	1.31*	6.88	-
Mechie	26.66		10.56		68.24		46.08		10.4*		4.31		14.21	-
Houshünha	16.12		15.18		47.33		44.49		5.98*		24.11		2.02	0.023
Ketsaga	18.18	12.32	21.12	16.47*	43.07	41.37*	51.19	22.03*	4.66*	4.81*	23.71	3.95*	1.14	-
Tefiüzürie	21.07		18.28		57.35		54.72		7.89*		16.51		1.86	-
Thedie	24.01	22.34	20.98	13.96*	59.42	47.89*	34.46	32.13*	4.27*	8.64*	9.03	5.37*	2.40	-
Kushü	27.90		18.54		62.09		51.71		7.91*		8.41		2.10	-

*-NIRS (values are blind predicted using an existing mixed crop model and hence likely to have less accuracy)

Wokha district

	DM%		CP (%)		NDF (%)		ADF (%)		ADL (%)		Ash (%)		Phenol (Gallic Acid Equivalent) (%)	Cyanogenic glycoside (%)
Wild forages	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2	Round 1	Round 1
Orhyuwo	14.75		24.07		58.04		20.88		8.04		19.57		1.31	-
Pyravo	13.79		17.06		59.53		50.45		5.39		13.14		3.53	-
Palluero	11.76		16.81		46.87		30.85		9.54		26.29		0.84	-
Nshaktso	18.01		16.57		69.73		44.19		5.83		8.52		2.78	-
Mevü	35.59		12.76		59.29		43.31		9.47		6.67		7.97	-
Mazuk	26.19	25.23	15.10	9.91*	82.75	54.10*	60.21	31.56*	14.37	7.22*	3.72	2.77*	3.19	-
Bobo	21.27	17.32	17.47	19.05*	67.59	47.64*	30.60	27.12*	9.57	6.41*	8.07	8.51*	1.94	-
Thungkyo	28.81		15.79		51.51		29.04		10.41		17.34		0.59	-
Rothan	10.78		20.99		54.73		48.94		5.48		17.30		1.40	-
Hanphyan	6.45		6.47		70.01		42.16		5.26		6.19		2.01	-
Chunglong	21.42	92.83	25.86	29.27*	61.61	38.97*	58.40	23.47*	6.88	5.58*	8.66	12.95*	0.97	-
Worosuthan	20.75		11.62		64.62		33.19		9.01		7.88		3.38	-
Mangsutemro	26.41		10.54		56.11		32.65		7.88		7.16		5.50	-
Shoro	9.09		14.88		58.79		37.80		10.53		14.06		1.74	-
Ninam	15.00	24.42	19.44	25.88*	60.57	34.87*	44.69	27.00*	5.80	6.55*	18.04	18.01*	1.07	-
Thungbak	26.08		13.27		57.20		25.13		13.27		6.28		12.40	-
Orajak	37.50		21.44		63.10		34.60		12.04		18.85		2.11	-
Khongungpen	18.07	25.02	10.36	25.29*	43.07	44.98*	32.59	30.73*	4.01	5.87*	18.37	15.76*	0.73	-
Eva	36.36		8.79		47.20		33.24		8.65		4.60		31.46	-

*-NIRS (values are blind predicted using an existing mixed crop model and hence likely to have less accuracy)

Mokokchung district

Wild forages	DM%		CP (%)		NDF (%)		ADF (%)		ADL (%)		Ash (%)		Phenol (Gallic Acid Equivalent) (%)	Cyanogenic glycoside (%)
	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2	Round 1	Round 1
Tsümaryi	12.13		18.94		48.69		35.21		6.35		15.49		2.64	-
Süngkumwa	21.42		14.02		67.62		50.76		11.4		10.89		2.49	-
Kumunatsutu	15.05		13.13		45.78		40.60		4.33		14.35		3.70	-
Eining	13.12		12.22		55.29		35.32		7.16		16.71		1.33	-
Entsuklawa	28.48		15.69		44.99		43.57		4.58		8.67		4.44	-
Kezuengti	41.32		15.95		68.96		42.56		9.22		16.90		1.76	-
Longsuwa	16.31	23.48	11.22	23.04*	49.81	36.94*	45.30	25.95*	10.41	3.06*	25.96	17.98*	0.65	-
Tobaccowa	22.01	25.32	20.95	16.52*	57.80	33.29*	42.96	31.89*	5.91	5.47*	11.10	19.40*	6.34	-
Shimongo	14.62	9.49	9.73	15.93	63.98	46.48	48.32	32.06	13.66	8.10	10.86	7.23	3.91	-
Ayongtu	15.93		11.53		66.81		60.01		14.18		12.55		3.31	0.054
Pangsemwa	19.26		19.98		46.77		32.64		7.32		14.36		2.52	-
Koruwa	24.42	35.01	16.66	17.44*	58.65	53.29*	54.25	35.98*	8.24	11.92*	9.01	7.70*	0.62	-
Atsubemjang	20.94		14.18		56.50		54.20		13.08		12.65		11.74	-
Jangpangjem	14.62	18.98	14.21	16.09*	74.53	56.02*	53.69	37.07*	10.79	5.87*	13.99	9.20*	1.47	-
Awa	19.25		14.21		55.56		42.98		11.32		6.52		5.93	0.053
Manglibaza	16.33		17.93		56.47		49.91		10.82		16.70		2.25	-
Yongbangza	18.53		19.22		56.34		33.25		8.10		17.92		2.36	-
Yongkumwa	24.32		14.03		36.40		26.82		6.93		11.74		3.54	-
Nokpangtiben	21.01		12.01		67.64		54.23		12.68		9.61		4.37	-
Chinaza	20.05		17.90		56.50		52.40		5.95		16.96		2.30	-
Indipiwa	14.32		15.72		60.06		35.01		7.94		11.22		5.83	-
Indipiwa	23.91		14.76		57.35		30.57		7.73		10.77		4.16	-
Lamlawa	25.01	18.32	13.85	19.23*	48.69	53.92*	38.89	34.08*	9.28	7.97*	4.83	10.64*	28.45	-
Chanilawa	20.13		19.84		45.18		44.84		3.27		22.30		1.33	-

*-NIRS (values are blind predicted using an existing mixed crop model and hence likely to have less accuracy)

	DM%		CP (%)		NDF (%)		ADF (%)		ADL (%)		Ash (%)		Phenol (Gallic Acid Equivalent) (%)	Cyanogenic glycoside (%)
Wild forages	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2	Round 1	Round 1
Natsulawa	33.12	28.60	15.04	14.98*	54.75	46.99*	35.21	32.81*	7.74	10.25*	10.86	4.52*	2.20	-
Atsutsula	22.42		16.05		63.85		53.11		5.49		9.50		2.48	-
Mechangwa	8.32		10.01		56.97		38.87		8.61		6.81		19.40	-
Sungjemwa	12.12		18.37		53.49		32.12		7.31		19.23		1.12	-
Kongjemlawa	20.62		18.47		57.59		49.08		12.18		14.40		1.45	-

Tuensang district

	DM%		CP (%)		NDF (%)		ADF (%)		ADL (%)		Ash (%)		Phenol (Gallic Acid Equivalent) (%)	Cyanogenic glycoside (%)
Wild forages	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2	Round 1	Round 1
Shimathung	13.10		27.01		59.56		24.03		5.95		14.06		2.24	-
Lühnak	10.01		11.41		75.92		69.99		9.73*		7.80		2.97	-
Amppishik	24.54	18.62	15.02	21.41*	68.62	44.43*	53.15	33.51*	10.84	6.91*	11.85	15.37*	2.50	-
Shisha	26.32		18.13		42.51		31.16		6.86		23.06		1.17	-
Ukchet	28.41		18.45		62.32		34.15		7.31		11.35		2.20	-
Deitang	20.01		11.30		68.57		40.32		9.40		17.99		3.00	-
Lekem	12.13		19.15		62.60		65.51		8.48*		12.82		2.52	-
Manak	18.51		16.23		52.55		32.19		8.68		12.89		1.04	-
Khabasu	24.32	32.01	13.08	16.57*	77.29	50.81*	65.19	33.36*	9.66*	10.61*	9.27	0.97*	3.49	-
Poklüh	16.41		16.74		46.33		47.79		10.77		15.96		1.39	-
Lühkong	14.26		15.68		56.32		45.60		10.94		16.14		9.49	--
Konglong	10.13		15.09		69.82		53.23		11.62		15.01		1.49	-
Lükpong	13.04		20.90		62.21		31.11		5.98		15.03		3.00	-
Kenyakjam	7.69		12.53		65.94		51.69		8.32*		11.13		3.72	-
Nemrüm	20.13		15.53		58.19		35.37		5.77*		19.17		1.31	-

*-NIRS (values are blind predicted using an existing mixed crop model and hence likely to have less accuracy)

	DM%		CP (%)		NDF (%)		ADF (%)		ADL (%)		Ash (%)		Phenol (Gallic Acid Equivalent) (%)	Cyanogenic glycoside (%)
Wild forages	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2	Round 1	Round 2	Round 1	Round 1
Thungkong	8.62		22.82		49.85		39.08		8.16		11.73		4.37	-
Khumsüng	11.14		22.12		57.44		33.45		7.35		13.78		2.35	-
Aubothokchi	24.18		19.80		57.67		37.81		8.00		7.64		2.89	-
Auchipen	15.13		11.33		39.14		22.57		7.19*		8.28		29.68	-
Hakshoushik	10.00		15.70		48.67		38.82		8.33		26.33		1.02	-
Sangpongshik	13.32		14.87		58.36		47.89		5.83*		15.35		2.07	-
Lilipong	7.07	12.01	16.36	19.13*	75.08	50.93*	58.05	31.12*	10.8*	10.64*	7.73	6.34*	1.01	-
Lilipong	29.12		23.44		47.87		30.19		6.56*		9.92		6.78	-
Hanjulüh	10.41		11.01		68.86		51.08		10.36		14.67		5.06	-
Lomoushik	20.31		19.04		52.97		48.88		6.46*		18.33		1.26	-
Konya	15.68	12.32	9.66	22.05*	52.90	43.26*	56.49	29.94*	7.97*	4.96*	16.87	14.78*	0.94	-
Shishahanbou	18.31		18.24		57.12		40.63		6.09*		21.36		2.25	-
Sangilenlekhin	18.14		12.01		52.32		62.20		8.17*		20.75		1.31	-
Lamangmanak	28.42	23.48	13.79	15.13*	65.69	44.23*	56.49	27.53*	15.10	8.68*	12.67	1.77*	1.84	-
Hausang	11.26		13.62		51.07		29.57		5.93		20.42		2.69	-
Khüzüjam	17.72		22.32		53.10		52.24		6.97*		14.74		1.72	-
Shishakhükpok	16.99		11.38		43.55		31.18		7.13		16.33		3.98	-
Lek	20.46		16.23		50.59		31.91		6.87		6.10		27.88	-
Semlühek	13.33		17.28		54.05		34.23		3.37*		15.18		10.61	-
Kebuik	14.56	12.94	23.09	11.82*	52.73	37.74*	31.35	26.41*	4.03*	11.48*	13.23	1.48*	2.40	-
Lühshik	12.41		15.63		72.01		48.91		8.75		13.36		2.58	-
Leikung	31.61	26.40	13.63	10.46*	51.65	61.18*	33.90	32.45*	7.51	12.06*	6.62	0.68*	1.58	-
Shishapu	27.42		20.76		62.35		39.22		8.20		17.13		1.30	-
Nguhrülu	12.79		18.14		55.94		50.97		7.39*		13.61		1.58	0.003

*-NIRS (values are blind predicted using an existing mixed crop model and hence likely to have less accuracy)

Annex - III. Index of plants according to their local names

Kohima

Sl.No.	Local name	Scientific name	Sl.No.	Local name	Scientific name
1	Chüsiga	Polygonum *hydropiper*	22	Tephrie-Nhasa	Gynura *crepidiodes*
2	Füfü	Curcuma *montana*	23	Papanrü	Alternanthera *sessilis*
3	Gati	Pilea *senipta*	24	Peho	Saurauia *roxburgh*ü
4	Gakra	Oenanthe *javanica*	25	Prügi	Polygonum *runcinatum*
5	Gare	Polygonum *chinenses*	26	Süta	Erigeron *bonariensis*
6	Gatherü	Clerodendrum *colebrookrianum*	27	Tefüzürie	Thunbergia spp.
7	Gathula	Angiopteris spp.	28	Temichede	Ficus *hispida*
8	Hieto	Erythrina *variegata*	29	Tenrutsuthu	Bidens *pilosa*
9	Houshünha	Spilanthes *acmella*	30	Terhobiepou	Mussaenda *pubescens*
10	Huru	Leea *sambucina*	31	Thedie	Trema *orintalis*
11	Keko	Gynura *cusimbua*	32	Theüprü	Commelina *benghalensis*
12	Kerienha	Mikania *cordata*	33	Therüprü	Commelina *obliqua*
13	Ketsanha	Strobilanthes *anisophyllus*	34	Thogwü	Gmelina *arborea*
14	Ketsasi	Kydia *calcycina*	35	Tsiekie	Impatiens spp.
15	Khukhie	Osbeckia *capitata*	36	Tsomhu	Rhus *semialata*
16	Kiphie	Dioscorea *pentaphylla*	37	Yedu	Pouzolzia *viminea*
17	Kushu	Urena *lobata*	38	Zielhounrü	Elatosema *disssectum*
18	Lovie	Boehmeria *platyphylla*	39	Zürü	Colocasia spp.
19	Lovie	Laportia spp.			
20	Mechie	Schima *wallich*ii			
21	Mezha	Alchornea *tiliaefolia*			

Woka

Sl.No.	Local name	Scientific name	Sl. No.	Local name	Scientific name
1	Bobo	Ficus *hirta*	11	Orajak	Spilanthes *acmella*
2	Chunglong	Leea *sambucina*	12	Orhyuwo	Amaranthes *viridis*
3	Eva	Terminalia *myriocarpa*	13	Palluero	Borreria *articularis*
4	Hanphyan	Gynura *crepidiodes*	14	Pyravo	Bidens *pilosa*
5	Khongungpen	Strobilanthes *bocrharioides*	15	Rothan	Galinsoga *parviflora*
6	Mangsu temaro	Osbeckia *capitata*	16	Shoro	Pouzolzia *hirta*
7	Mazuk	Entada *phesedoides*	17	Thungbak	Rhus *semialata*
8	Mevu	Diospyros *peregrina*	18	Thungkyo	Ficus spp.
9	Ninam	Pouzolzia spp.	19	Worosuthan	Mussaenda *pubescens*
10	Nshaktso	Dioscorea *alata*			

Mokokchung

Sl.No.	Local name	Scientific name	Sl.No.	Local name	Scientific name
1	Atsubemjang	Ficus spp.	16	Lamlawa	Osbeckia *capitata*
2	Atsutsula	Saurauia spp.	17	Longsuwa	Elatostema *leneolatum*
3	Awa	Gmelina *arborea*	18	Manglibaza	Gynura *crepidioides*
4	Ayongtu	Ficus *globosa*	19	Mechangwa	Schima *wallich*ii

Tuensang

Sl.No.	Local name	Scientific name	Sl.No.	Local name	Scientific name
1	Amppishik	Bagonia *palmata*	21	Lomoushik	Pouzolzia *hirta*
2	Aubothokchi	Mussaenda *frondosa*	22	Lühkong	Ficus spp.
3	Auchipen	Oxyspora *paniculata*	23	Lühnak	*Achyranthes aspera*
4	Deitang	Costus *speciosus*	24	Lühshik	Trichosanthes *anguina*
5	Hakshoushik	Pilea *ambrosia*	25	Lükpong	Impetiens *felcifer*
6	Hanjulüh	Porana *racemosa*	26	Manak	Elatostema *lanoelatum*
7	Hausang	Spilanthes *acmella*	27	Nemrüm	Justicia *procumbens*
8	Kebuik	Trema *orientalis*	28	Nguhrülu	Vitis *caprialata*
9	Kenyakjam	Impatiens spp.	29	Poklüh	Ficus spp.
10	Khabasu	Ficus *auriculata*	30	Sangilenlekhin	Pouzolzia viridis
11	Khumsüng	Momordica spp.	31	Sangpongshik	Plantago *major*
12	Khüzüjam	Strobilanthes *anisophyllus*	32	Semlühek	Tetrastigma *serrulatum*
13	Konglong	Gynura spp.	33	Shimathung	Abelmoschus spp.
14	Konya	Pouzolzia *sanguinea*	34	Shisha	Boehmeria *platyphylla*
15	Lamangmanak	Saurauia *panduana*	35	Shisha	Justicia *versiculos*
16	Leikong	Turpinia *pomifera*	36	Shishahanbou	Pouzolzia spp.
17	Lek	Terminalia *myriocarpa*	37	Shishakhükpok	Strobilanthes *callosus*
18	Lekem	Debregesia *longifolia*	38	Shishapu	Urtica spp.
19	Lilipung	Polygonum *chinense*	39	Thungkong	Leea *sambucina*
20	Lilipung	Polugonum *runcinatum*	40	Ukchet	Colocasia *esculenta*

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