

NUTRIENT AND MINERAL STATUS OF PIGS RAISED UNDER EXISTING FEEDING AND MANAGERIAL FIELD CONDITION OF ASSAM

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The present investigation was carried out to find the nutrient and mineral status of pigs reared in existing field condition of Assam state of India. Data pertaining to managerial and feeding practices, locally available feeds consumed by the pigs and blood samples were collected and analysed for proximate principle and minerals from five agro climatic zones of Assam. The study reveals that most of the farmers raise their pig either by scavenging or tethering / penning methods. Only large farmers and farmers who raise the animals for breeding purpose practise stall feeding system. Most of the farmers raise the pigs for fattening whereas some of the farmers raise pig for breeding and only small population raise pigs for both breeding and fattening purpose. The analysis of feeds revealed that the crude protein (CP) and ME contents ranges from 2.10% to 16.70 %, and 1.679 to 3.607 Mcal /kg DM respectively, which is below the NRC requirement. The level of macro and micro mineral content of feeds showed that the Ca, P and Zn were deficient in almost all the ingredients. The average level of serum minerals showed deficiency (%) as Ca 80.73, Mg 77.4, P 62.48, Mn 6.2, Fe 1.56, Zn 1.53 and Cu 0.425. Therefore, it is concluded that for augmentation of productive and reproductive performances of pigs raised under field condition and fed only locally available feeds and fodders require supplementation of protein, energy and minerals. It was also observed that many locally available feeds and fodders were rich in protein, energy and mineral content and the farmers may be advised to feed those feeds and fodders for better economic return from pigs.

Pig rearing is an integral part in socio economic life of entire North Eastern

Region of India. Out of the 13519 million pigs in India, the NER is having 3778 million pigs which is about 28.22% of the total pig population of the country (Vision 2025 ICAR NEHR). In Assam the pig population is 1543 million (Basic Animal Husbandry Statistics 2006). There are more than ten recognized tribal communities in Assam and all of them rear pigs. Besides the tribal community unemployed youth / woman also raise pigs for sustainable income generation. It is a small scale, low input enterprise but contributing immensely towards the economy of the tribal people over the years without much scientific intervention. Pigs are generally raised by traditional system of management and feeding. The rural farmers of this region has developed local resource based feeding system in which pigs are mainly dependent on local vegetation, crop residues and kitchen waste (Kumaresan *et al* 2007). Indigenous as well as crossbred pigs are reared by the farmers .But in absence of scientific management and feeding the optimum productive and reproductive performances are low. Till now few studies have been undertaken to find out the nutrient status of pigs raised under different feeding and managerial systems in field condition. Therefore, the present investigation have been carried out to find out the limiting nutrients affecting pig husbandry including micro and macro mineral status of pigs raised by different categories of farmers under field condition.

MATERIALS AND METHODS

Out of the six agro climatic zones of Assam data from five zones were collected for the present investigation. Three villages from one or two districts of five agro climatic zones were selected based on pig population.

Table 1: Chemical compositions of locally available pig feed resources (D.M. Basis)

Chemical Composition (%)	Ingredients							
	Banana stem	Sweet Potato	Colacasia	Casava	Kitchen Waste	Rice Polish	Water Hyacinth	Juguli
Dry Matter	20.20	44.76	26.00	41.00	21.08	90.00	8.00	22.00
Ether extract.	2.60	1.10	5.20	0.70	6.26	17.20	2.90	10.20
Nitrogen-Free Extract	65.10	85.80	40.40	91.40	70.48	54.80	44.00	61.50
CF	19.00	3.00	16.90	3.50	4.25	4.30	20.90	16.00
Total ash	10.10	4.30	13.00	2.20	6.77	10.30	15.40	3.80
CP	3.2	5.80	24.50	2.10	12.24	13.40	16.70	8.5
Predicted energy value on DM basis (Mcal /kg)	1.975	3.607	2.277	3.600	3.630	3.540	1.679	2.834

Table 2: Mineral compositions of locally available pig feed resources (D.M. Basis)

Ingredients	Mineral Contents						
	Ca (%)	P (%)	Mg (%)	Fe (ppm)	Cu (ppm)	Mn (ppm)	Zn (ppm)
Banana Stem	0.14	0.09	0.12	1.50	2.45	18.08	2.45
Sweet Potato	0.18	0.11	0.14	0.94	2.40	11.45	2.10
Kitchen Waste	0.09	0.04	0.10	0.62	2.55	20.47	3.30
Rice Polish	0.09	1.16	0.66	646.00	14.00	146.00	11.00
Water hyacinth	1.72	0.68	-	-	-	-	-
Colocasia	0.65	0.15	-	-	-	-	-

The data were collected mainly during winter dry season for two occasions. Data pertaining to managemental and feeding practises, economic status of the farmers etc were collected using a standard format. The feeds as offered by the farmers and different locally available feeds that are consumed by the pigs were collected for proximate analysis. Blood samples were collected from different categories of pigs from the areas under study to determine the micro and macro mineral profiles. Proximate analysis of the feed stuff was done following standard procedures. The macro minerals Ca & Mg and micro minerals Cu, Zn, Fe, Mn and Mo were estimated using Atomic Absorption Spectrophotometer (GBC932A, Varian Spectro AA220, USA). The Phosphorus level in feed, forages and serum were estimated colorimetrically using commercial kit (Crest Biosystems, Goa,

India). The data generated were statistically analysed by paired T test (Snedecor and Cochran, 1994).

RESULTS AND DISCUSSIONS

It was observed that most of the farmers raise their pigs either by scavenging (1-60%) or tethering / penning methods (38-95%). Stall feeding practice was observed in 2-11% of the farmers who raise the animals for breeding purpose as well as organized farms. Most of the farmers (>80 %) raise the pigs for fattening to be sold either on live weight basis or as pork. Some farmers (10- 70 %) raise pig for breeding and they sold the piglets in the market. A small percentage (5-10%) farmer raises pigs for both breeding and fattening purpose. Similarly, different preference of pig rearing by farmers has been reported in the study

Table 3: Average Serum mineral concentration of pigs of different Agro climatic zones of Assam

Districts (Agrolimatic Zone)	Ca (mg %)	P (mg%)	Mg (mg%)	Fe (ppm)	Cu (ppm)	Zn (ppm)	Mn (ppm)
Dhemaji, Darang (North Bank Plain)	8.63±0.32	2.74±0.22	2.31±0.33	2.85±0.19	0.99±0.32	2.56±0.16	0.42±0.09
Golaghat (upper Brahmaputar Valley)	9.32±0.22	2.77±0.45	2.24±0.11	2.70±0.12	0.97±0.11	2.58±0.10	0.21±0.07
Karbi along (Hills zone)	8.24±0.26	3.90±0.22	2.03±0.09	2.45±0.10	0.42±0.07	2.15±0.21	0.31±0.03
Kokrajhar, Kamrup (Lower Brahmaputra Valley)	9.45±0.10	3.08±0.22	2.43±0.10	3.18±0.09	0.83±0.06	2.70±0.07	0.19±0.06
Morigoan (Central Brahmaputra Valley)	8.79±0.05	3.22±0.21	2.60±0.06	2.83±0.25	1.04±0.10	2.27±0.11	0.42±0.05
Average of all Zone	8.89±0.22	3.14±0.21	2.32±0.10	2.80±0.12	0.85±0.11	2.45±0.10	0.31±0.05

conducted in Mizoram by Kumaresan *et al.*; 2006.

Proximate analysis of the locally available feed stuffs revealed that the crude protein (CP) contents ranges from 2.10% in cassava to 24.50 % in Colacasia (Table 2) and the energy value ranges from 1.679Mcal/kg in water hyacinth (*Eichhornia crassipes*) to 3.607Mcal /kg in sweet potato. As per NRC (1998) the requirement of CP and ME for pigs weighing 20-50Kg and 50- 80 Kg is 18% and 15.5% and 3265 kcal / kg, respectively. The body weight of the experimental pigs in field condition ranges from 20-50kg and 50-80kg for local and cross bred pigs, respectively. The average feed fed to the pigs ranges from 1.500 - 2.000 kg comprising different ingredients as mentioned above combining with *ad lib* scavenging. From the observations on feeding of pigs by the farmers it is obvious that most of the animals are on protein and energy deficient diet as compared with NRC requirement for swine.

Evaluation of different macro and micro mineral content of locally available feed stuffs it was observed that the level of Ca, P

and Zn were deficient in almost all the ingredients as compared to dietary requirement (NRC, 1998) of Ca, P and Zn for pigs weighing 20-50Kg and 50- 80 Kg. However, some ingredients are rich in these minerals and farmers may be advised to include these ingredients in the diet to mitigate the problem of mineral deficiency.

The average serum mineral concentration of pigs of different agro climatic zones of Assam (Table 3) revealed that the serum concentration of Ca, Mg, P, Mn, Fe, Zn, and Cu bellow the normal range (Georievski, *et al.*; 1982) present in healthy pigs. Comparing the normal serum level of these minerals in pigs and as per the formula adopted by Kumaresan *et al* (2009), the extent of mineral deficiency from highest to lowest order are in the percent study revealed that Ca 80.73%, Mg 77.4%, P 62.48%, Mn 6.2%, Fe 1.56 %, Zn 1.53 % and Cu 0.425 %. Present finding in respect of different mineral deficiency is comparable with the report of Kumaresan *et al* (2009) in pigs of Mizoram. As the farmers do not provide any mineral supplements to the pigs the deficiency either showing

clinical signs or in sub clinical form is common in field condition.

CONCLUSION

For augmentation of productive and reproductive performances of pigs raised under field condition and fed only locally available feeds and fodder, supplementation of protein, energy and minerals are essential as some of the commonly available feeds are deficient either in protein, energy and various macro and micro minerals or all of the essential nutrients. However, there are many feeds and fodders which are rich source of protein, energy and minerals. Suitable economical ration can be formulated by incorporating various locally available ingredients. Therefore farmers may be advised to feed those feeds & fodder to their pigs.

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