

# CHEMICAL CHARACTERISTICS AND BIOLOGICAL EFFECTS OF UNCONVENTIONAL FEED LOCAL PIGS IN THE TRADITIONAL CARE SYSTEM IN NORTH MINAHASA DISTRICT NORTH SULAWESI PROVINCE

*by Fenny Wolayan<sup>1</sup>*

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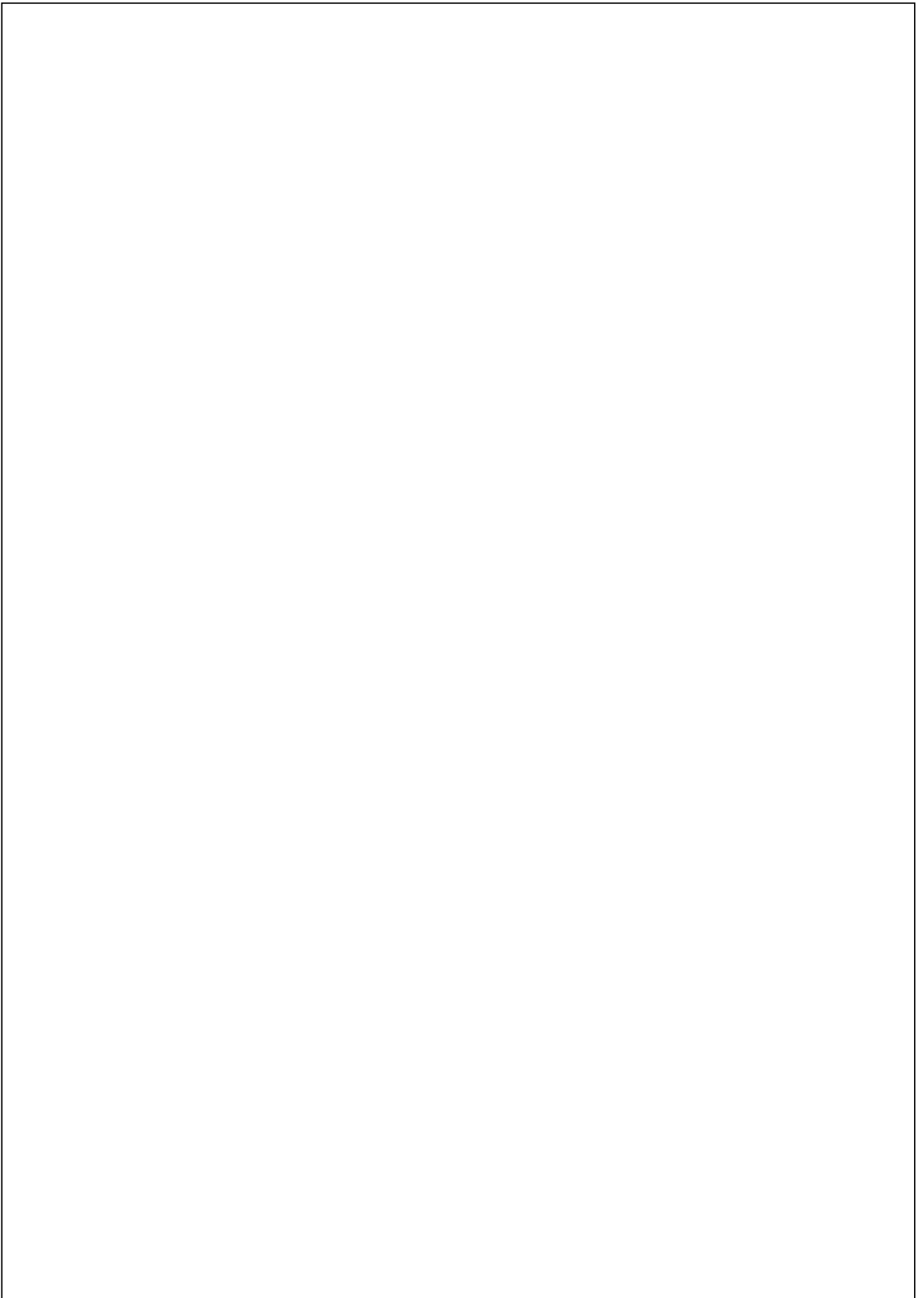
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## CHEMICAL CHARACTERISTICS AND BIOLOGICAL EFFECTS OF UNCONVENTIONAL FEED LOCAL PIGS IN THE TRADITIONAL CARE SYSTEM IN NORTH MINAHASA DISTRICT NORTH SULAWESI PROVINCE

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### Abstract

*This study aimed to identify the type of feed local pigs is traditionally reared in North Minahasa regency, North Sulawesi Province. This study obtained preliminary data, the ownership of cattle generally range below 5 tails with most of the maintenance system is extensive, semi-intensive and thus less controlled feeding pattern. The study was conducted in 11 villages which are determined by sampling purposive and has obtained data that can recommend the type of feed local pigs are typically used in animal husbandry and of variations in feed ingredients used taken 4 (four) types of materials that use the top position. The fourth composition of feed ingredients has been analyzed chemically by proximate analysis to determine the quality or content of nutrients. The results of this study can be concluded that rice bran, coconut pulp, wallet and plant tubers taro/taro forest (mixture of stems and leaves) is a type of feed raw materials most commonly used in the maintenance of local pigs in North Minahasa Regency. The second type of feed raw material used is largely determined by the types of crops are cultivated on the location and maintenance.*

**Keywords** : local pig, semi-intensive, feeding pattern, feed ingredients

### Introduction

Commodity pigs it is possible to thrive in North Sulawesi because it is caused by the Minahasa people of North Sulawesi in particular, Manado, Bitung, is largely a consumer product pigs. In 1998 the pig population in the province amounted to 3.89% of the total pig population in Indonesia.

Today the pig farmers in the area of North Sulawesi in general have superior offspring to maintain the nation's pigs-Landrace cross Yorkshire, Duroc, Poland China, which is derived from the project help the President (BANPRES). Also in North Sulawesi are the descendants of local pig species *Sus Selebensis* maintained to a lot of rural areas or in villages that although ideally the genetic quality has not been achieved but a lot of traditionally farmed by farmers in villages with a small amount of possession but not with the purpose komersial as family savings. Many factors influence the success of the pig business, among the environmental factors are easily addressed both quantitatively and qualitatively is the factor of food or feeding a day-to-day is handled directly by the farmer.

So far so maintenance effort models can still survive even contribute economically viable for farmers, because there is a purpose to maintain a family of pigs as the savings that can be sold at any time in addition to fulfilling the animal protein nutrition (meeting the needs of the early days of holidays, weddings, salvation, etc.). On the maintenance of local pigs or pig village administration is not the main concentrations of even the first year of studies found a breeder who does not use or provide concentrates in the maintenance of livestock due to only utilize the available natural food in the maintenance area is used as a main dish of pigs is therefore it is necessary to identify the characteristics of the feed in terms of type and quality associated with livestock will need nutrients and how they affect the growth of pigs



when compared to using commercial rations or concentrates. Feed characteristics can be measured or judged by the content of the nutrients contained in such materials that can be measured by laboratory analysis techniques. Nutrients are protein, fat, carbohydrates, minerals, vitamins, and energy value. Feed ingredients identified in this study were very varied and identified 10 types of feed ingredients and which occupied the top four places are the Pacific Islands Taro tuber (purse), rice bran, coconut pulp, stems and leaves of Talas/taro forest.

### Material and methods

Study to inventory the types of feed used in livestock feeding on local pigs have been carried out by the method of survey, in several villages in North Minahasa Regency that according to preliminary observations have a number of livestock ownership. The village election conducted purposive sampling as well as samples of breeder and this is because the unavailability of data at district and village level statistics on the number of breeders and the number of livestock ownership.

Data is collected by direct observation and interview techniques by using a list of questions that have been provided. The final results of data collection are presented in tabular form of data and variables that were analyzed quantitatively (Singarimbun, and Effendi, 1995).

The data collected are: Number of Livestock ownership (supporting data, age and weight of cattle (data support), number of feed and the feeding means (supporting data) and feed type (primary data).

Types of feed were analyzed chemically identified by proximate analysis to determine the content of the nutrients contained in such materials.

### Results and discussion

#### 1. General State of Study Sites

Geographically North Minahasa regency lies between latitude  $01^{\circ}18'30''$ - $01^{\circ}53'00''$  S longitude  $124^{\circ}44'00''$ - $15^{\circ}11'00''$  E, total area is  $937.65 \text{ km}^2$  or 6.14% of the province of North Sulawesi, Indonesia.

The border area is in the east by Bitung City, west of the City adjacent to Manado, on the north bordering the District Sangihe, Talaud district, North Sulawesi and Maluku Sea, and on the south by the Minahasa regency, the territory is divided into 10 subdistricts and 125 villages. In 2004, the population of North Minahasa District totaled 174,852 inhabitants.

#### Commodity Profile

**Table 1.** Commodity Profile in North Minahasa Regency

No	Sector/Commodity	Seed/No	Description
1.	Primary-Plantation: Coconut	Leading	Production Last Year (2006): 49,060.00 Tons
2.	Primary-Plantation: Cloves	Leading	Production Last Year (2006): 402.00 Tons
3.	Secondary-Industry: Integrated Oil Industry	Leading	And availability of raw materials in the area (For Kom. Secondary Tertiary) Coconut (44,014.00 tons)
4.	Secondary-Industry: Coconut Oil	Leading	And availability of raw materials in the area (For Kom. Secondary Tertiary) Coconut (44,014.00 tons)

5.	Secondary-Plantation: Coffee	Not Featured	Production Last Year (2006): 3.00 Ton
6.	Primary-Plantation: Cashew	Not Featured	Production Last Year (2006): 18.00 Ton
7.	Primary-Plantation: Pepper	Not Featured	Production Last Year (2006): 40.00 Ton

Data source : *Statistics of Indonesia 2006-2008 Estates Directorate General of Estate Crops Ministry of Agriculture Jakarta 2007*

### **Livelihood**

North Minahasa Regency that most of the region is coastal, the main livelihood of the population are farmers. In coastal areas, based on the results of the study-RLKT RTL-Likupang Wori Bay Area in 2004, the role of agriculture in providing employment is dominant, which is about 78.07%. From these percentages, approximately 53.49% and 24.58% are farmers are fishermen. The main crops cultivated are coconut, cloves, fruits and pulses. (RTLRLKT Coastal North Minahasa, 2004).

### **Village Survey**

Of the 10 districts in North Minahasa district, the survey determined that 11 villages Mentahage Island; Wori; Kima Bajo; Langsa; Darunu; Pontoh; Kema; Likupang; Serey; Wusa and Winetin. The location of these villages are far from the central district.

### **2. System Maintenance and Number of Livestock Ownership**

The number of local pigs scattered in North Minahasa district not included in the scope of the study, identifying data is the average number of livestock ownership in the 10 villages which are rural purposes. Data obtained from a breeder that, on average ownership of pig between 1-5, is almost evenly 1-2.

System maintenance is generally semi-intensive, livestock and tied in the back yard beside the house and there are also some cages, but some are released to the location of farm / forest foraging alone in the daytime and nighttime grounded and bonded.



**Fig. 1.** Pigs Livestock Maintenance System (removable, tied up and caged)

### 3. Feed Types Identified

The selection of the type of feed that familiarity will be described, based on the use by most farmers in feeding the pigs are kept coconut pulp, rice bran and taro tubers Islands (purse).

**Table 2.** Type of feed (3 ranked highest) Uses in Each Study Site

No.	Village	Type of feed
1.	Wori	1. Taro tuber (purse) 2. Coconut pulp 3. Coconut
2.	Island Mentahage	1. Forest tuber crops (a mixture of stems, and leaves). 2. Coconut pulp 3. Kitchen waste (vegetables, fish waste)
3.	Kima Bajo	1. Taro tuber (purse) 2. Coconut pulp 3. Banana skin
4.	Langsa	1. Plant a forest tuber (mixture of stems and leaves). 2. Coconut pulp 3. Rice bran
5.	Darunu	1. Coconut pulp 2. Forest tuber crops (a mixture of stems, and leaves). 3. Heart banana
6.	Pontoh	1. Taro tuber (purse) 2. Cassava 3. Coconut pulp
7.	Kema	1. Rice bran 2. Fish waste 3. Cassava
8.	Likupang	1. Coconut pulp 2. Fish waste 3. Rice bran
9.	Serey	1. Rice bran 2. Fish waste 3. Cassava
10.	Wusa	1. Rice bran 2. Beans and corn stover 3. Coconut pulp
11.	Winetin	1. Coconut pulp 2. Taro tuber (purse) 3. Rice bran

Sources: Survey research Juni-July 2009



**Table 3.** The content of nutrients of feed types identified

No.	Nutrient	Coconut pulp	Rice bran	Hump purse ( <i>Xanthosoma sagittifolium</i> )	Stems and leaves of taro ( <i>Colocasia esculenta</i> L) Scott.) sp
1.	Water (%)	71.98	8.63	86.63	85.80
2.	Ash (%)	0.56	13.75	8.56	12.09
3.	Crude protein (%)	7.16	5.43	8.48	16.20
4.	Coarse fibers	18.98	21.09	14.05	18.10
5.	Crude fat (%)	24.15	4.03	1.55	8.24
6.	BETN (%)	49.15	55.7	67.36	45.37
7.	GE (kcal/kg)	4955	3603	4083	3219
8.	Calcium (%)	0.003	0.023	0.36	0.22
9.	Phosphorous (%)	0.0008	0.21	0.38	0.11

Sources: *Laboratory of Nutrition and Food Chemistry Faculty of Animal Husbandry Padjadjaran University in Bandung, 2009*

#### **a. Coconut pulp**

North Sulawesi region dubbed the "nyiur melambai" considering the number of coconut trees in this area. <sup>23</sup> remaining coconut pulp is the result of extortion coconut meat coconut milk to be taken. Old fruit pulp is the material source of vegetable oil (oil content 35%). Nutrient composition of an old coconut meat is protein 3.4%, fat 34.7%, carbohydrate 14%, calcium 0.021% and 0.021% phosphorus, 46.9% water. The procedure of making coconut oil is an old fruit peeled and then cut open and the meat is removed from the shell. And shredded coconut meat is ground manually or using machinery. Crushed fruit and add water with a ratio of 1:2. Furthermore, the extract pressed by machine or manually presses and then filtered to obtain coconut milk (Elfianus, 2008).



**Fig. 2.** Coconut pulp Fresh / Cooked

**b. Rice bran**

Rice has a composition, 70-72% endosperm, 20% rice bran, rice bran 7-8.5% and 2-3% of embryos (Ju and Vali, 2005). Using rice bran in Indonesia to date is as animal feed. This is because the nutrient content of rice bran is high enough.



**Fig. 3.** Rice bran

In this study the data obtained using rice bran as feed local pigs are classified as coarse bran. The use of rice bran as livestock feed local pigs in almost all villages surveyed due to the rice plant is one of the leading commodities in North Minahasa regency.

**c. Pacific Islands Taro tuber (purse)**

Belitung taro *Xanthosoma sagittifolium* with the scientific name of this family include chronic Areacea and is a plant that has a stem or stem tuber is actually false petiole. Tubers are used as food by boiling or frying. In the western part of the African continent, in North Sumatra, South Sumatra, East Kalimantan, North Sulawesi and West Nusa Tenggara have been cultivated by farmers on a regular basis. Belitung taro planting using spacing of 50 x 50 cm and 100 x 100 cm. While the cultivation of irregular covering areas of Aceh, Central Kalimantan, Bengkulu, West Kalimantan and East Nusa Tenggara. In general, farmers cultivated plants in the yard around the house and gardens. The average yield per clump ranged from 0.25 to 20 kg.



**Fig. 4.** Purse plants (*Xanthosoma sagittifolium*)



**Fig. 5.** Hump purse

**d. Stem and Leaf Taro (*Colocasia esculenta* (L) Scott.) Sp**

Taro (*Colocasia esculenta* (L) Scott.) is divided into two varieties, namely varieties of *C. esculenta* varieties *var. esculenta* and Talas *C. esculenta* *var. antiquorum*. *C. esculenta* *var. esculenta*, the tuber is single bulbs of medium size or large (depending on the variety). Varieties found in the study site are a kind of Talas / taro tubers in the absence of forests. This type of taro grown in the soil slightly moist has a stem and green leaves are smooth and shiny.



**Fig. 6.** *Colocasia esculenta* (L) Scott



**Fig. 7.** Talas plant stems / tuber forest

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### Conclusion

Based on the research results can be concluded that:

1. Coconut pulp, rice bran, and plant bulbs purple taro / taro forest is a type of feed raw materials most commonly used in the maintenance of village pigs in North Minahasa district of North Sulawesi Province.
2. This type of feed raw materials are used is largely determined by the types of crops are cultivated on the location and maintenance.

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