1.1. Introduction

Livestock play a major role in Timorese society. According to the 2015 population and Housing Census, 87% of households in Timor-Leste own livestock. Ownership of swine and chickens is the highest at 71.5% for both animals, an increase of 4.5% from 2010 (Smith *et al*, 2017, Bettencourt *et al*, 2015).In contrast, ownership of goats and cattle had increased from below 10% in 2010 to 22.5% and 26% respectively in 2015.The main reason for owning livestock in Timorese society is to fulfil social obligations and to provide a source of income. Swine's along with goats, cattle and buffalo are required for ceremonial occasions such as weddings, funerals and other important events. A secondary reason for animal production is to provide meat for human consumption. However it is not an important part of the average human diet with 7% never eating meat and only around half the population (54%) eating meat once per week. Only 8% of the population eat meat threeor more times each week(Smith *et al*, 2017, Bettencourt *et al*, 2015). Swine also play an economic role as a source of funds when families need cash for payment of school fees and other necessities. Many households will continue to feed a Swine long after it has reached its maximum body weight to provide a reserve of funds for when money is required. In this way, the pig is similar to having money in an account at the local bank, but not as secure. In a survey of three administrative post sit was found that 31.3% of households (range 3.4 to 55.6) reared swine's for self-consumptionand 52% of households (range 34 to 77) reared swine's for sale (Smith *et al*, 2017, Bettencourt *et al* 2015).The total number of swine in Timor-Leste increased from

330,435 in 2010 to 419,169 in 2015, an increase of more than 25%. However, in households that owned pigs the number of pigs/household was only 2.9, an increase of 0.2 (7%) from 2010, suggesting that the increase in pig numbers was due mainly to an increase in the number of households owning pigs. The figure of 2.9 pigs/household was also lower than for chickens (6.3), cattle (4.3) and goats (3.4). Urban households also had marginally fewer swines/household (2.5) compared with rural households (2.93).

The farmers use fed feeding likely cassava, coconut, taro, residues of horticulture plants, and rumbia (sago) for mixing become swine feeding in traditional fed. The fed feeding mentioned above that Farmers never used and become tradition useless increase and promote on swine performance, and also do not time management for feeding caused decreasing of swine growth in every year.

Legume proteins, when used as protein supplements, make an appreciable contribution to the amino acid content of diet. However, their protein is deficient in one or more essential amino acids. Some essential amino acids are "locked in" inhibitors which are present in the bean and are made unavailable (Naawu, 1979 *et al* in Liener, 1979).Legume grain is a one of the food crops, and as an animal feeding likely swine's in our research site. Animal feeding by legume grains production for pigs in actual become increasing pigs growth until finishing phases in every period. Legume grains production as a feeding of swine, and become a new technology package to resolved and less demand immediately in Timor-Leste.

There is now an increasing debate about the viability of using grown legumes in pig diets as a potential replacement for imported mung bean, soya bean, and common beans meal and this is due to food security, sustainability and environmental concerns and nitrogen (N) retention, growth performance quality of grower, (Whitea, 2015).

In Timor-Leste farmers do not use legumes feed for swine maintenance. The importance of an appropriate available energy supply in a balanced diet for efficient protein use by livestock was stressed, a high energy to protein ratio being needed to optimize the use of the protein.

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Feeding pigs in Timor-Leste still use traditional method by boiling mixed materials as in our study cases with legume grain such soy bean, mung bean, and common beans. In the study we conducted, all materials from the bean grains were grinded and mixed based on the treatment designed, then it is boiled to feed the pigs compared. Unlike RNAgri.Lda that feeds the pigs use soy bean waste that mixing with maize.

The swine fed feedings have contents of protein such maize 9.8%, mung bean 7.4%, soy bean 40%, and common bean 25%. Legume grains are source of proteins for animal feed and also their production can provide a range of benefits both farms and for feed manufacturers. The exploitation of legume grains are a classic example of successful development and use. Mung bean,common bean and soybean are exploited as grain crops in temperate farming systems and their production for home

grown protein supply is encouraged in the Timor-Leste to reduce dependency on imported proteins, (Siriwan, 2012).

The protein of soybean, mung bean, and common beans are contained the considerable quantity of lysine (6.2g/16gN), but value of protein is limited by methionine and cysteine content (2.9g/16gN). With regard on high protein content, the soybean meal is mainly use in poultry and pigs nutrition. In mixtures for poultry content of soybean meal can approximate to 40%. Generally, soybean seeds content 5,6-11.5% of water, ranges for crude protein is from 32 to 43,6%, for fat from 15.5 to 24.7%, for crude ash from 4.5 to 6.4%, for neutral detergent fiber (NDF) from 10 to14,9%, Acid Detergent Fiber (ADF) from 9 to 11,1%, carbohydrates content from 31.7 to 31.85% on a dry matter basis (Banaszkiewicz, *et al*, 2011).

1.2. Formulation of the Problem

1.2.1. How to know positive impact of mung bean, soy bean, and common bean mixed with maize on swine performance ?

1.2.2. How to know which combination legumes can increase the performance of swine that later become a technology package for livestock farm (swine) in Timor Leste ?

1.3. Objectives

1.3.1. General Objectives

1) To intensify landscape and diversify new technology package with farmers and extension for protecting swine in Timor Leste.
2) Legumes grains production become a feeding of swine, and become new technology package to resolve, and less demand of swine diseases immediately and also can to recommend to swine Farmers in Timor Leste.
3) To motivate and advise farmers to produce mungbean, common bean, soybean, and maize for increasing household economics

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1.3.2. Specific Objective

The spesific objectives of research are:

1) To know positive impact of mung bean, soy bean, and common bean mixed with maize on swine performance.
2) To know which combination legumes can increase the performance of swine that later become a technology package for livestock farm (swine) in Timor-Leste.

1.4. The Importance Of Investigation

1). As one of the methods that contribute and good information, especially the provision of legumes for the development of Swine.
2) As scientific information for researchers at Instituto Nacional De Ciências E Tecnologia (INCT) and Universidade Oriental Timor Loro Sa'e, especially in the Faculty of Agriculture, Department of Livestock.

3) As a reference for agricultural farmers, specially the owners of Swine in Timor-Leste.

1.5. Justification

Outline of the relevance and benefits of the proposed research in the area that will accomplish.

Sustained growth in animal productivity has become an ideal model and a political goal of agricultural by animal development in Timor-Leste. Local participation is essential for the implementation of sustainable agriculture of animal strategy. Conducted a case study in Timor-Leste, an important gain animal production base in Timor-Leste, to find ways to motivate swine farmers to participate in strategies of sustainable animal maintainance.

Economically in Timor-Leste indicated that low agricultural by animal economic efficiency by the swine protecting still in less enthusiasm for animal feeding among local farmers. This is a potential risk for Timor-Leste feed security and sustainable agricultural development. The backward development of the rural economy limited improvement of farmers' environmental awareness. Moreover, poor rural labour quality implied a lack of local participation in sustainable animal production for completely of market demanding. Suggestions for sustainable agricultural development include establishment of a reasonable market and agricultural subsidy mechanisms by RDTL to vulnerables of household, veterans, human oldest, basic and vocational education for young adults, effective agricultural instruction and environmental education agencies and two-way communication mechanisms.

The study case become an animal feeding challenges in the base, it will be accomplished by the research treatment with community farming in the field. This research will be conducted and as a motivation and innovation to farmer for application in their Agricultural area for protecting, improving and increasing weight

of swine by legumes grain meal feeding in the future to attend market demanding special Local swine. Recently, swine demand of marketing have looked and bought linked to VIII Government of RDTL program by the *Césta Básica*.

The legumes grains substitute to soybean meal will be increased swine performance in Farmers' field in the future. Technological processes improved nutritional value of seeds and soybean products, its will be raw soybean seeds as well as the soybean products contain many anti-nutrient factors, which decrease their nutritional value and conduct to depression of animals performance and worsening of this health. Adequate heat processing inactivate these factors. The soybean requires the processing in aim to elimination of anti-nutrient factors particularly in non ruminants feeding.

1.6. The organization of the Research

This research was conducted on August 2021 to October 2021 in Aldeia Zero Cinco (05) Hamlet, Fatuhada village, Dom Aleixo Sub District and Dili Municipality with the elevation is about 8 meters Above Sea Level (ASL). The swine research site of pigsty sizes with lenght 6 m x width 4 m = 24 m^2.

1.7. Hypothesis

R1 (Corn 50% + Mung bean 15% + Soy bean 20% + Common bean 15%) produced minimum result.

R2 (Corn 40% + Mung bean 20% + Soy bean 15% + Common bean 25%) produced maximum result.

R3 (Corn 40% + Mung bean 20% + Soy bean 20% + Common bean 20%) produced sufficient result

R4 (Corn 50% + Mung bean 10% + Soy bean 15% + Common bean 25%) produced optimum result.

2. Research Methods

The method used in this research was Experimental Design

2.1. Research Design

This research was used Latin Square Design with 4 treatments,4 rows, and 4 coulums will be employed for 16 (sixteen) combination feeding treatments. The swine feeding has 4 treatments such as R1 (corn 50% + mung bean 15% + soy bean 20% + common bean 15%), R2 (corn 40% + mung bean 20% + soy bean 15% + common bean 25%), R3 (corn 40% + mung bean 20% + soy bean 20% + common bean 20%), R4 (corn 50% + mung bean 10% + soy bean 15% + common bean 25%).

2.2. Variables Measurement

Sampling only use into site experiment of swine. The 6 (six) variables observation have a different component of parameter such body weight (kg), body length (cm), feed conversion ratio, diameter of body (cm), adding of body weight (kg) and feed ratio consumption rates (kg) will be measured and determined on a day 14 per two weeks during two months.

2.3. Data Analysis

All data was collected from the field, managed in an MS Excel spreadsheet database being transfer for further analysis to Genstat and ANOVA of Latin Square Design with Genstat software 18^{th} eddition and also continuing analysis significant difference betwen treatment were continued analysis by Least Signicance Difference test (LSD, $p < 0.05$ and 0.01).

2.4. Area of Study

This study is one of the cases and was resolved it by the research method and application of treatments applied. The end of study was shared and recommend to Farmers in Timor-Leste and also become a handbook and references for everyone in animal feeding. The community based animal production is the traditional decentralized production but still decrease of performance by less technology of traditional farming system.

2.5. Ethical Considerations

This series is designed to encourage us to think about the wider implications that our work has on society. Some of our choices, well or ill considered, ethical or not, are being questioned by people who have visions for agriculture that differ from the prevailing paradigm. We live in a time when many are questioning the priorities of our animal production systems and confronting us with our role in it. This essay and the series that follow is intended to help us as professionals in swine to listen to them and examine our own believes, values, and morals and then reconsider our choices from this new, more well rounded perspective. Interestingly, people engaged in agriculture, whether as producers, scientists, administrators, legislators, or protestors, all tend to believe that they are on high moral ground. The discoverers of new technologies, for all of us could consider become new technology packages in Timor Leste special to Farmers. All of roles that be valid in INCT, we will follow and consider it, hopeful of would be great for us in during our research on going and well and also hard our relationship.

2.6. Lay Out

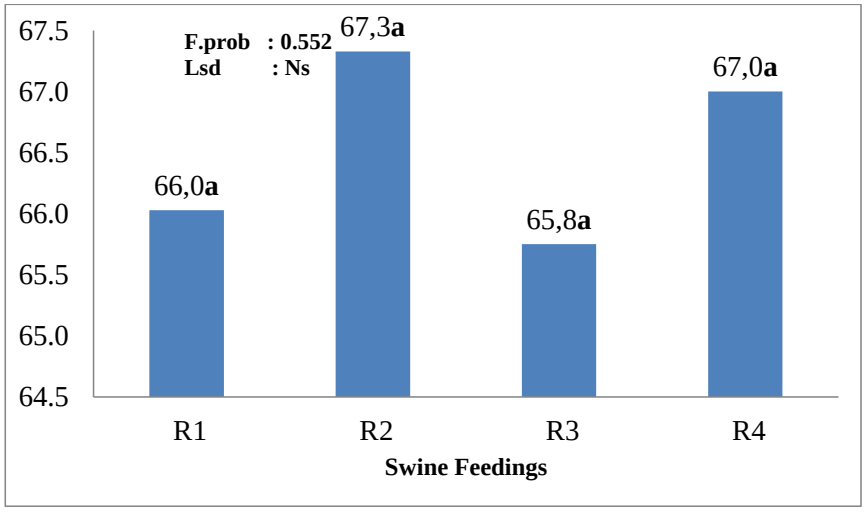
Periods	A1L1	A2L2	A3L3	A4L4	Rows
I	R2	R4	R3	R1	Row I
II	R3	R2	R1	R4	Row II
III	R4	R1	R2	R3	Row III
IV	R1	R3	R4	R2	Row IV
Colums	Colum I	Colum II	Colum III	Colum IV	
Objects:					
R	Feeding				
A	Animal				
L	Pigsty				
R1 (Corn 50% + Mung bean 15% + Soy bean 20% + Common bean 15%)					
R2 (Corn 40% + Mung bean 20% + Soy bean 15% + Common bean 25%)					
R3 (Corn 40% + Mung bean 20% + Soy bean 20% + Common bean 20%)					
R4 (Corn 50% + Mung bean 10% + Soy bean 15% + Common bean 25%)					

Source: Adopted from , Sastrosupadi, (2000)

3. REZULTS ANALYSIS

Graph 1. Swine length (cm)

The graphic 1 below shows that based on the analysis of variance by the frequency of probability does not give significantly different by swine feeding of legumes on body length. However, the result of a high swine length was showed at R2 (corn 40% + mung bean 20% + soy bean 15% + common bean 25%), compare with other three treatments.



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Diameter of body

The graphic 2 below shows that based on the analysis of variance by the frequency of probability was give significantly by swine feeding of legumes on Diameter of body. However, the result of a high swine length was showed at R2 (corn 40% + mung bean 20% + soy bean 15% + common bean 25%), compare with other three treatments.

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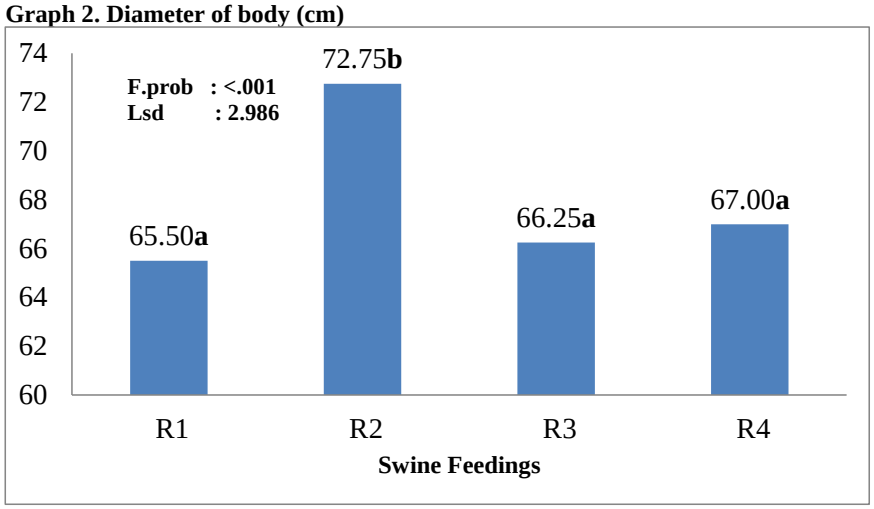
Graph 2. Diameter of body (cm)



Swine Weight (kg)

The graphic 3 below shows that based on the analysis of variance by the frequency of probability was given significantly by swine feeding of legumes on Swine weight. However, the result of a high swine length was showed at R2 (corn 40% + mung bean 20% + soy bean 15% + common bean 25%), compare with other three treatments.

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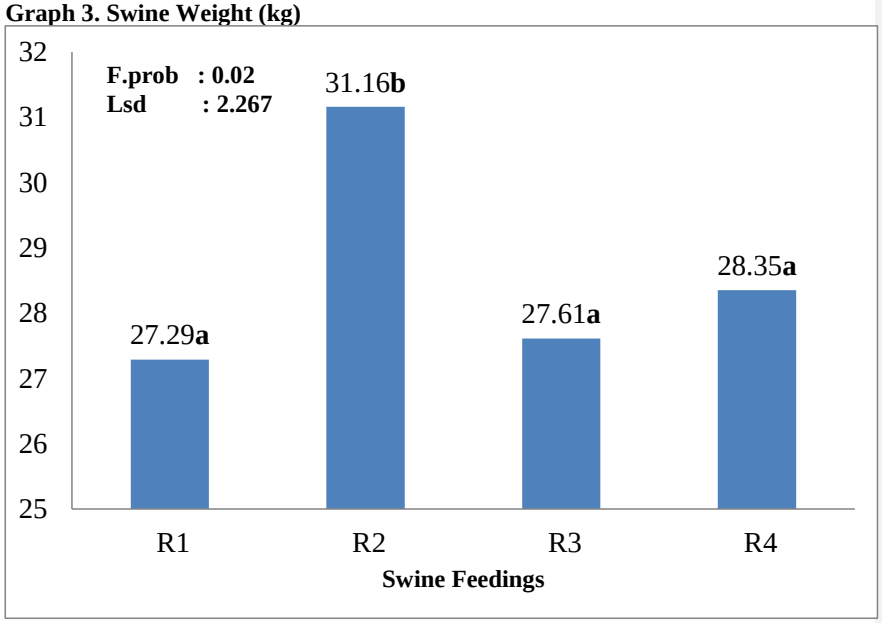
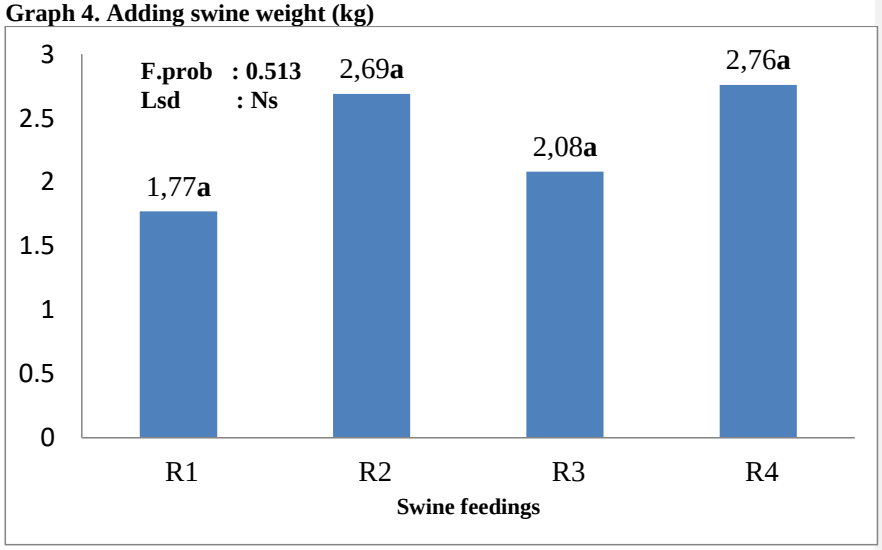
Graph 3. Swine Weight (kg)



Adding swine weight (kg)

The graphic 4 below shows that based on the analysis of variance by the frequency of probability does not give significantly different by swine feeding of legumes on adding swine weight. However, the result of a high swine length was showed at R4 (corn 50% + mung bean 10% + soy bean 15% + common bean 25%), compare with other three treatments.

Graph 4. Adding swine weight (kg)



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Conversion Ratio

The graphic 5 below shows that based on the analysis of variance by the frequency of probability does not give significantly different by swine feeding of legumes on conversion ratio. However, the result of a high swine length was showed at R2 (corn 40% + mung bean 20% + soy bean 15% + common bean 25%), compare with other three treatments.

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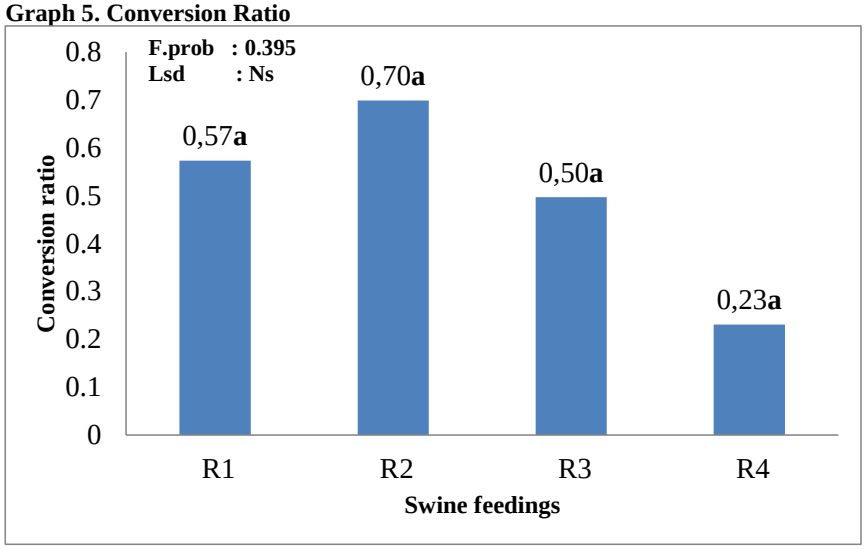
Graph 5. Conversion Ratio



Consumption Feedings

The graphic 6 below shows that based on the analysis of variance by the frequency of probability does not give significantly different by swine feeding of legumes on Consumption Feedings. However, the result of a high swine length was showed at R4 (corn 50% + mung bean 10% + soy bean 15% + common bean 25%), compare with other three treatments.

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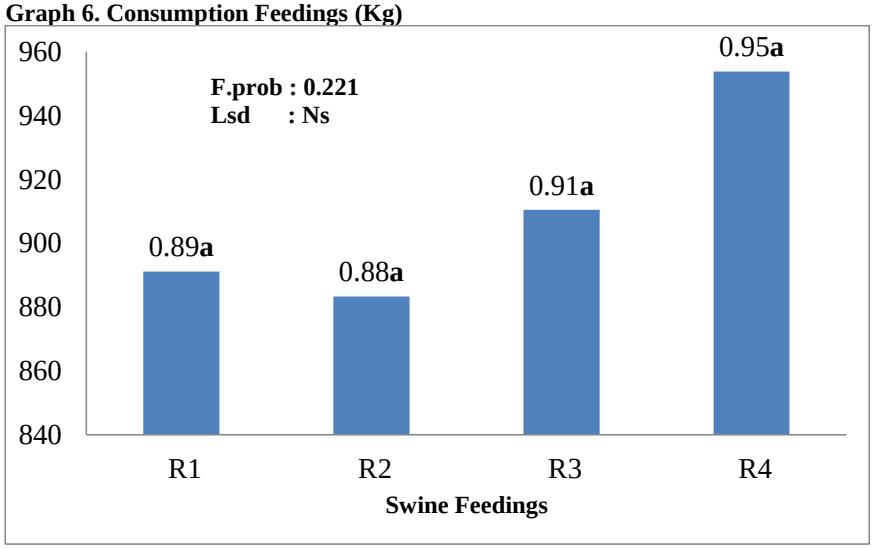
Graph 6. Consumption Feedings (Kg)



4. DISCUSSION OF THE RESULTS

Graph 1. Swine length (cm)

The variable of swine body length had gotten legume feedings showed no significance difference between treatments. The variation of feeding of legumes such as soy bean, mung bean, and common beans, were combined with maize become a diet feedings and well on swine growth in body length by targets of protein percentage per legume feedings and approved with least significance difference (LSD) 5% in similarly variation periods. By the visualization performance in the reality of field experiment showed that have uniformed, according to legume feeding proteins into content of legumes and original percentage of protein is consistence in actual. The performance and growing of swine's body length of based on feeding resources, whereas in quadratic on the base by effective studied maintenance on protein efficiency, in occasion of normal condition with scale on growth phase increasing swine body length, also adapted of environment climate identical for local swine during a time. The local feeding resources of legumes potential area of tropics superior compared to middle tropics, and also non-conventional resources of swine feeding legumes, would be able and prepared in every sites could become swine feedings, (Whitea, 2015).

Graph 2. Diameter of body (cm)

The treatment corn 40% + mung bean 20% + soy bean 15% + common beans 25% (R2) very significance different compared to other feeding treatments, but R1, R3, and R4 feedings did not show significance difference between them on diameter of body. In occasion that diameter of body highest in treatment corn 40% + mung bean 20% + soy bean 15% + common beans 25% (R2) with value 72.75cm compared to other feeding treatments. In statistical analysis that diameter of body category

included in quantitative data of descriptive, because by observation visualized method that utilization equipment of roll meter is become an one of measurement for getting primarily data's in experiment sites, and in observation were done by periods with data tabulation based on Genstat application software for Latin Square Design (LSD). Diameter of body swine methods are unit experiment that showed on graph 2, based on quantitative data with values 72.75 cm got in treatment corn 40% + mung bean 20% + soy bean 15% + common beans 25% (R2) compared to other feeding treatments, because each period adds diameter of body formed growth by bone, meat, lipids become an one of the potential growth for a rising meat in relation of diameter of body, (Budaarsa 2012). The experimental analysis of ANOVA that legume feedings nutrition content with difference percentage of stimulating on adding growth for swine body, and body width by anatomy, and physiology onto body for increasing swine growth link for economic growth, though in some of expectation not permitted yet, but all of conditioning for other indication showing with legume feeding treatment such corn 40% + mung bean 20% + soy bean 15% + common beans 25% (R2) able to increased performing of swine in the field experiment by visualized by ANOVA analysis per each treatment have variation directly by adding swine's' body performance, (Pasaribu, *et al*, 2015). In occasion that able to see in photographs of swine body growth in the annex. Anatomy seen that swine body have a progress based on variation by legume feeding effect can increase by diameter of body observation in directly.

Graph 3. Swine Weight (kg)

Treatment corn 40% + mung bean 20% + soy bean 15% + common bean 25% (R2) significant difference of swine weight result with other feeding treatments, but between three of feeding treatments such as R1, R3, and R4 did not show impact on swine weight. In occasion that highest swine weight in corn 40% + mung bean 20% + soy bean 15% + common bean 25% (R2) treatment with value 31.16 kg, and lowest swine weight in corn 50% + mung bean 15% + soy bean 20% + common bean 15% (R1) with values 27.29 kg. The difference in response of the swine's at increasing levels of supplemental lysine replacement with legume feeding of R2 treatment code maybe explained by the fact that swine in the fast growth line ate more feed than swine's in the slow growth line ($p < .02$); Thus fast growth swine's were exposed to larger amounts of inhibitors. Average daily feed intake and feed efficiency were significantly different within each growth line.

However, there was a trend on reduced feed efficiency with mungbean, soy bean, and common beans replacement of supplemental lysine from other feeding can not arranged, when compared to the feeding percentage has not served, (Naawu, 1979 *et al* in Liener, 1979). The physically experiment of swine's in the field very important on utilization of treatment maintenance used swine feedings efficient and appropriately, in term of local feeding of legumes from agricultural based for festering economical growing by legumes production grains for swine's feeding for all household quantitative data's on swine weight.

This research result showed that legumes local feeding by the percentages combination for four levels legumes types feeding best is corn 40% + mung bean 20% + soy bean 15% + common beans 25% (R2), when compared to the other treatment of feedings were added swine weight as a growth growing early on the application greatly. In an earlier trial (Maxwell *et al*., 1983), 25% level of the supplemental lysine replacement (7.5% mung beans in diet) did not cause any decrease in feed efficiency in the growing phase of production, its' will be same level of swine feeding with utilization corn 40% + mung bean 20% + soy bean 15% + common beans 25% (R2). Base on the swine performance needs to attention feeding of coarse protein necessity for stimulating efficient of progress. In general, increase of swine growth for weight each period that is added weight per day and per week, (Tillman *et al*., 1998). The performance of swine by effect of feeding corn 40% + mung bean 20% + soy bean 15% + common beans 25% (R2) immediately that per day swine should be eaten, have not rest, its' mean that adding swine weight for meat, and also as a proteins necessary into swine body, so that saw by quantitative data base on swine growing body. The growing as a processing of adding swine growth part of body components such as heart, bones, and other components, except lipids.

(Anggorodi, 1994). Observation made by Maxwell *et al*. (1983) into Naawu, 1979 that back fat thickness was not affected by dietary treatment since mungbean substitution did not produce any major changes in the energy content of experimental diets compared to the control. The data were also analyzed by sex and line. Barrows and fast growth line pigs had significantly greater average daily gain and back fat

thickness than gilts and slow growth line pigs ($p < .02$) in the growing and finishing phases. A greater average daily feed intake was observed in the fast growth line when compared to the slow growth line in both growing periods, and when compared to research result earlier done. Utilization of swine feeding from legumes with difference percentage conversion ratio produced adding swine weight did not same and less based on coarse proteins content 14.48% -18%. Swine feeding for starter phase indicated that coarse protein had directly with percentage 18%. Although, has data's periods have a progressing for adding swine weight on period 3, and 4, whereas adapted in environment preliminary by coarse proteins experimented for swine's performing, (Pasaribu *et al*, 2015, Nangoy *et al.* 2019). The result of swine feeding, normally from same sources of difference legume production types such soy bean, mung bean, common bean, and maize combined together by its' percentages conversion ratio related on swine weight starter phase for getting initial. In occasion that adding's swine performance weight per day per period normally about 197.14gr per a head per day, when compared to research result by Pasaribu *et al*,(2015) that adding swine weight per a head got 200g – 700g. This condition permitted for swine growing able to responding feed treatment by swine grower phase is good, served and adapted effect of corn 40% + mung bean 20% + soy bean 15% + common beans 25% (R2). Continued Pasaribu *et al*, 2015, *et al* Tiro and Fernandes, (2018) that adding swine weight able to 0.1 kg per a head per day, when compared to research result early from UNITAL Agriculture Faculty of livestock Departament with weight 0.2kg per a head per day by effect of combination feeding of conversion rates. This is an

effect of environment factor and swine feeding (quantity and quality) influenced on growth in the field experiment.

Graph 4. Adding swine weight (kg)

The result showed that swine weight from first period got conversion ratio of feeding and ending of research was uniformed with extra percentage of 5% for initial weight in total quadratics consumption by getting of swine experiment. Swine feeding whereas content of 18% in quadratic ally with several of combination coarse protein by feeding types and accumulated for all percentages estimation into stimulation for formulating on the form growing in adding swine weight per period, (Sola *et al*, 2011).

Normally, swine growing day to day needs, how many weight of swine that adding in progress by time and ages, though did not follow by treatment, but still in caused late of swine growth, when did not attention maximum with fed feeding treatment intensive, semi modern, and will be indicated that exchanged time per period in formation for progressing of swine weight adding, (Wea, 2010).

In processing adding of swine weight that during necessity by swine for feeding consumption is applicable, efficient, and good for formatted of large anatomy by the metabolism and palatability swine of feeding combination percentage as a feeding treatments of legumes production grains, in occasion that by the feedings efficient of nutrients that content calcium, phosphor for strongly energy, its will be viabilities of swine for recuperated weight each period for fastly adding progress by

swine weight per day, and also absorption by feeding proteins content, (Tiro, and Fernandes. 2007). This indication showed that though other variable like the faces linking to the quadratics faster of formation process on swine growth by this studied, but did not implemented by using faces variable viability. An additional dietary treatment in starter phase was incorporated into swine weight per period. Accordingly, five grower dietary treatments were evaluated by ANOVA Latin Square Design (LSD) by effect of legume production grains swine feeding. Each grower treatment was fed to four rows and four columns entire female swine's (initial weight 17.24 kg). Animals were transferred onto grower treatments at 17.24 kg and the trial continued until animals weighed 31.16 kg. The starter swine's were transferred onto the same legumebased diets for grower period (thus, for example swine's fed the legumes production dietduring the starter phase were transferred to the swine feeding of legumes production diet for the grower phase), (Whitea, 2015). Diets were available on an add libitum basis,from a weighed amount of feed so that any spillages or feed refused could be weighed and feed intake (R2) for each animalcalculated. Fresh water was available an add libitum. Swine's were weighed on a weekly basis and weekly feed intake data wereobtained throughout the period of the study. Performance calculations were conducted for starter 17.24 kgand grower 31.16 phases of the study, (Whitea, 2015).

Graph 5. Conversion Ratio

On the graph 5 that legume swine feedings were not significant different by frequency of probability into ANOVA of Latin Square Design (LSD) with value 0.395 biggest than probability < 0.05 on conversion ratio variable observation rates. By the graph 5 that did not significant influences between values indicated on swine feeding, it's mean that capacity of swine had done conversion rates for forming meat had not been difference between treatment of legumes feeding having "other namely" that adding swine weight for starter phases mentioned, thus for them are efficient for transforming immediately for meat onto swine actual a lot of consumption of feedings, (Pasaribu *et al*, 2015). Research result concluded that value of conversion ratio of swine by the legume feedings combined with maize, based on those percentages formulating have not uniformed and unbalanced percentages different too, and continuing ideas from expert Wea (2010) reported that conversion ratio not efficient yet, when compared with legumes production grains combination rates of 100%, such soy bean, mung bean, and common beans combining with maize. The expert Patience et al (2014) that utilization energy of swine feeding is an one of the based important for feeding efficiency, though other factor accompanied and intervention become an influenced. Conversion ration minus in R4, R3, and R1 did not directly affect by minus feeding energy. Although, between treatment of legume feeding of swine were not significant different, but able to partner with numerical of

value conversion rates is high parallel to minus conversion feedings. Conversion ratio is as a variable very important for indicating, however using legumes feeding applicable, when recommend to husbandry in first for sharing information about legume feedings for substituted, other feedings such from agriculture residues, and also other foods are improved performance for local swine to consumption feeding with food resting. In occasion that by the performance swine weight for profit abilities feedings, and on processing by metabolism and palatability's for its energy of forming into quadratic well, and strongly in one of expression performance result, its' meaning that swine meat ad equating and proven, (Noblet and Perez. 1993).

Graph 6. Consumption Feedings (Kg)

The indicated shows that per day into one period with total grams of feeding, based on formulation from legume feedings' combination though did not follow by normally, and minus mixing fed on treatment process have not an uniform of percentages. Application rates showed that in an initial swine performance before consumption legume feedings are also able to responding by coarse protein an initial was supported. Levels of coarse proteins able to influences swine growth by the swine weight. The high coarse proteins caused for minus palatability's feedings, and could affect to swine weight endings. Palatability is one of the factors very important to determining consumption progress, though in other research reported that in the long term of husbandry are able to resolve with nutrition content by effecting onto feedings. Consumption legume feedings necessity by swine per ahead per day with

weight 891.2g to 953.8g, in average is 922.5g per day a head of swine. Legume feedings quantities for this research are supported by Sihombing (2006) that 1.5kg to 2,75kg. Swine capacity for absorbing feeding as an efficient nutrition component will be relative same for completely swine necessity ideal, and growing of swine. Those factors are influenced by swine feeding of legume production grains are big body, swine weight, and ages, thus caused by conditions of environment such temperature, humidity, and sunlight., The aspects are determinate is high, and minus of quality of legumes feedings were proteins, energy, vitamins, minerals, and other materials would be forming swine's growing, and process for absorbing biology, (Poluan, *et al*, 2017,*et al* Sinaga and Martini, 2010), and also continued by Poluan, *et al* (2017), Frank *et al* (1983) and Chiba *et al* (1991), that swine for starter of primarily on period until grower phases with weight are 17.24kg to 32.00kg fed feedings by adlibitum that delivering water to swine did not follow of volumes. The generally, energy as legume feedings still controlling with quantitative consumption, though influences by highly energy into feedings, but quantitative variance for consumption for day to day are affect its' self of swine.

5. CONCLUSION AND RECOMMENDATION

5.1. Conclusions

According to the result by analysis of variance (ANOVA) we concluded that:

1. Observation of swine weight, and diameter of body by legume feedings are significant different between treatments.
2. Observation of swine length, adding swine weight, consumption feedings, and conversion ratio by legume feedings are not significant different between treatments.
3. Legume feedings applicable for swine growth is combination rates of corn 40% + mung bean 20% + soy bean 15% + common beans 25% (R2) with value weight 31.16kg, and diameter of body is 72.75 cm, when compared to other result treatments on growth phases.
4. Application of legume feeding treatments was combined with maize grains able for increasing swine's' growth faster during two months (8 weeks) in an initial value 17.24kg to 31.16kg, between starter and grower able for adding swine weight 13.92kg, when compared to other feedings.

4.2. Recommendations

1) Combinations of legume feedings such corn 40% + mung bean 20% + soy bean 15% + common beans 25% (R2) are able to apply by husbandry, and will be conducted with feedings formulations.

2) Recommend to Ministry of Agriculture and Fisheries (MAF) for socialization about the legume production grains such mung bean, soy bean, and common beans to husbandry in Timor-Leste.
3) Recommend for continuing research by this title for testing appropriate for concrete values, and also adding variables not test yet.

REFERENCES

Anggorodi, H. R. (1994). Ilmu Makanan Ternak. Penerbit PT. Gramedia Pustaka Umum. Jakarta.

Banaszkiewicz T, (2011). Nutritional Value of Soybean Meal. Siedlce University, Natural Faculty,Poland.Publishing Process Manager Petra Nenadic Techn ical Editor.Teodora Smiljanic Cover Designer Jan Hyrat Image Copyright Jim Barber, 2011. Used under license from Shutterstock.com.

Budarsa, K. (2012). Babi guling Bali dari beternak, kuliner, hingga sesaji. Buku arti. Cetakan Pertama.

Lemme, A., V. Ravindran, and W. L. Bryden. (2004). Ileal digestibility of amino acid in feed ingredients for broilers. World's Poult. Sci. J. 60:423-427.

Naawu, R., (1979). Mung beans as a protein source for growing, and finishing swine. Bachelor of Science. University of Science and Technology. Kumasi, Ghana. 1986.

Noblet, J. and J. M. Perez. (1993). Prediction of digestibility of nutrients and energy values of pig diets from chemical analyses. J. Anim. Sci.

Pasaribu E. S, Sauland, Dudi. (2015). Identifikasi sifat kualitatif dan kuantitatif babi lokal dewasa di kecamatan sumbul, kabupaten dairi, sumetera utara. Identification of qualitative and quantitative nature of the local pig adults in subdistrict of sumbul, dairi, north sumatra. Fakultas Peternakan Universitas Padjadjaran. Alumni Fakultas Peternakan Unpad.

Poluan R., Petrus R.R.I Montong, Jantje F. Paath, Vonny R.W Rawung. (2017). Pertambahan Berat Badan, Jumlah Konsumsi Dan Efisiensi Penggunaan Pakan Babi Fase Grower Sampai Finisher Yang Diberi Gula Aren (Arenga pinnata Merr) Dalam Air Minum Wenny. Manado.

Sastrosupadi, Adji. (2000). Rancangan percobaan praktis bidang pertanian. penerbit PT Kanisius. Cetakan ke 10.

Siriwan D. Martensa et al, (2012). Alternative plant protein sources for pigs and chickensin the tropics nutritional value and constraints: a review. Journal of Agriculture and Rural Development in the Tropics and Subtropics.

Smith A, (2017). Assessment of Smallholder Pig Production Development Opportunities in Timor-Leste.TOMAK. Technical Report 14, July 2017. Australia, To'os ba Moris Diak. International.

Solà Oriol, D., E. Roura, and D. Torrallardona. 2011. Feed preference in pigs: Effect of selected protein, fat, and fiber sources at different inclusion rates. J. Anim.

Tillman, E., H. Hartadi, S. Reksohadiprajdo dan S. Labdosoeharjo. 1998. IlmuMakanan Ternak Dasar. Gadjah Mada University Press, Yogyakarta.

Tiro, B. M. W. and P. T. Fernandes. 2007. Kajian teknologi budidaya dan pengaruhnya terhadap penampilan ternak babi. Pros. Sem. Nas. BBPP. Teknologi Pertanian.

Wea, R. 2010. Performans produksi ternak babi yang mengkonsumsi limbah organik pasar. Partner.

Whitea, G.A, L.A. Smith, J.G.M. Houdijkb, D. Homerc, I. Kyriazakisd, J. Wisemana. 2015. Replacement of soya bean meal with peas and faba beans in growing, and finishing pig diets: Effect on performance, carcass composition and nutrient excretiona Division of Animal Sciences, School of Biosciences, Sutton Bonington Campus, University of Nottingham, Loughborough.UK.