



# Characterization of Rabbit (*Oryctolagus cuniculus*) Production System in Partido

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## Abstract

Rabbit (*Oryctolagus cuniculus*) farming has recently contributed to major impacts on food security in both local and holistic aspects. This paper aimed to identify the socio-demographic profile of rabbit raisers in Partido and characterize their motivation in pursuing rabbit production. This study was conducted in the 4th congressional district of Camarines Sur. It had a total of 24 rabbit farmer respondents who are raising at least 10 rabbit heads and with one-year production experience from the municipalities of Tigaon, Goa, and San Jose. Mixed methods research design was utilized in the study reinforced with open-ended interview questions. The data gathered were analysed by means of descriptive statistics. Findings revealed that the majority of the rabbit raisers were composed of young self-employed professionals who had 1 - 2 years of engagement in rabbit production. 70% started raising rabbits for the purpose of pets or leisure then learned to shift production for the purpose of selling and personal consumption. The majority sell their rabbits using Facebook Marketplace and share posts online. Raisers normally join watch YouTube vlogs and join rabbit associations to benchmark. 62% had basic training in rabbit raising in the form of webinar series and limited face-to-face. It was recommended to conduct an awareness campaign about rabbit farming and edibility of rabbits as alternative healthy meat through extension activities.

## Subject Areas

Agriculture, Food Security

## Keywords

Rabbit Farming, Rabbit Raisers, Livestock, African Swine Fever, Partido

## 1. Introduction

Livestock, specifically pig and poultry production in most industrialized and in-

creasingly developing countries, are characterized by its intensive consumption demands, and initially driven by post-war government policies to increase production for cheaper food consumption [1].

It was confirmed by the Department of Agriculture that the African Swine Fever (ASF) outbreak in the Philippines started in July 2019 [2]. ASF is a critical viral disease of pigs that has affected pork production around the world and has caused serious threats since 2007. The virus-causing ASF usually circulates in sub-Saharan parts of Africa where the virus is thought to have originated among wild warthogs and eventually became common even among domesticated pigs [3]. This affected not only the place where ASF outbreak was first recorded, Africa, but also many other countries all over the world like the Philippines. In February 2020, the Philippine Department of Agriculture made a statement that the agency is eyeing rabbits as an alternative to pork in relation to the circumstances brought about by the ASF outbreak in the country [4].

Rabbits were brought by the US Peace Corps and missionary groups to the Philippines after the Second World War, which aims to alleviate the food scarcity due to the devastations of the war [5]. However, the majority of Filipino households normally considered rabbits as pets [6]. In most developing countries, rabbit farming and production have majority contributed to food security and income generation [7]. The New Zealand White Rabbit (*Oryctolagus cuniculus*) are domestic types which are mostly produced by low-income farmers who have a small scale backyard production for meat. [8].

One of the vital factors that could be attributed to the baseline of human need is food security, in which it is believed that a human may cease to thrive or survive without this [9]. As defined by the United Nation's Committee on World Food Security, food security means that everyone at all times should obtain physical, social, and economic access to safe, adequate, and healthy food that aligns with the food preferences and dietary needs to sustain an active and healthy life. In line with this, the Food and Agriculture Organization of the United Nations said that rabbits in the context of food security have a substantial capacity to help small farmers around the world. Backyard farming of rabbits, which is a relatively simple enterprise, can yield good income and aid in upgrading the dietary needs among households both in rural and urban areas [10].

Aside from having nutritional benefits from its meat, rabbits have very short growth cycles, hence the production can be more expandable [11]. According to the United States Department of Agriculture, rabbit meat belongs to the list of most nutritious types of meat consumable by man. It has low fat and bad cholesterol content with high levels of protein [12]. Although putting rabbit meat in the mainstream still requires the market and the people to be educated and enlightened [13]. There is a need for the rabbit marketing potential to be tapped and promoted since its meat is a good source of nutrients alongside being a good source of income even with a minimum amount of investment (Veneracion, 2017) [5].

The main objective of this study is to collect baseline information on the current status of rabbit industry in Partido, Camarines Sur. Specifically, this paper aimed to identify the socio-demographic profile of rabbit raisers and characterize their rabbit production system.

## **2. Materials and Methods**

### **2.1. Study Area**

This study was conducted in Partido, the 4th congressional district of Camarines Sur, specifically in the municipalities of Tigaon, Goa, and San Jose from October-December 2021. These towns were selected to be the study area because of the increasing number of farmers engaging in rabbit raising and production based on the initial data in the Bicol Rabbit Raisers Association, KRM Rabbitry, and Tigaon Bigvonn' Rabbirty Facebook pages.

### **2.2. Sources of Data**

This study utilized a quantitative design since it aimed to profile and characterize the existing rabbit raisers and producers in Partido. A qualitative design was used to measure the motivation and constraints of the respondents in rabbit production through open-ended questions. Descriptive method is appropriate to be used in this study because it attempts to collect quantifiable information for statistical analysis of the demographic segment's nature of the respondents [14].

### **2.3. Sampling Method**

This study had a total number of 24 respondents who are engaging in rabbit raising and production. The twenty four were: 8 (Tigaon), 8 (Goa), and 8 (San Jose). The study used total enumeration for the Tigaon respondents based on the list of provided by the Municipal Agriculture Office of the said municipality. Meanwhile, the snowball or chain referral sampling was used for Goa and San Jose respondents since their Municipal Agriculture Office currently do not have a list of registered rabbit raisers and producers. The snowball or chain referral sampling is a recruitment strategy in which research respondents are asked to assist researchers in identifying other potential subjects [15]. The criteria for the selection of respondents: must have at least 1 year experience in rabbit raising, selling, and production; and must have at least 10 heads of rabbits in their farm or backyard.

### **2.4. Data Collection and Analysis**

Data were collected using survey-questionnaire derived from the published researches: A Survey on Rabbit Production in the City of Gaborone, Botswana [16]; and Characterization of Rabbit Production Systems in Kenya [17]. The researchers had both virtual and face-to-face data gathering depending on the preference of the respondents. Interview and direct observation were conducted to supplement data gathering following the minimum health and safety Co-

vid-19 Protocol. The data were tabulated and analysed using the statistical tools such as: mode of frequency distribution, percentage, and weighted mean.

### 3. Results and Discussion

#### 3.1. Personal Characteristics of the Rabbit Raisers

**Table 1** presents the personal characteristic of the respondents from the three area of study (n = 24). All groups were dominated by male with 70.83% and female with 29.17%. The male group in Tigaon had a percentage of 20.83% while in Goa and San Jose had 25%. In terms of age, majority of the respondent's age ranged from 21 - 30 years with 41.67%. It was followed by the age group between 41 - 50 years with 29.17%. The 31 - 40 years age group had a total percentage of 20.83% while the least age group with 8.33% respondents ranged from 8.13%. This means that more young generations ranging from 21 - 30 years old are engaging into the growing industry of rabbit farming. In the study of Mallon (1992), it was found out that rabbits are prominent to children and young generations because of their friendly and sociable attitude to human [18]. During the interview, it was observed that most of the young respondents enjoyed raising rabbits and learned the basic practices of raising through YouTube and Facebook Rabbit Raisers group. The cognitive aspect of multitasking young adults are "wired" differently and overall yields into more helpful result. They spent most of their time and energy by sharing social messages, being entertained and distracted from online content [19].

Data showed that there was equal percentage of single and married respondents which corresponds to 50%. Likewise, in Tigaon, there were equal frequencies of both single and married status with 16.67%. It can be interpreted that the municipality of San Jose had the highest number of single rabbit growers with 20.83% while the municipality of Goa had 20.80% for the highest number of married status.

The educational background of the respondents shows that majority were college graduate and or currently pursuing tertiary education with 58.33%. It was followed by high school graduates with 25%. The highest group which has the highest number of college graduate with 29.17% was San Jose. It was followed by the Goa group which has 20.83%. This means that famers with higher level of education appeared to keep more rabbit for commercial purposes. They are more commercially oriented and productive in selling rabbits [20].

The data showed that 37.5% of the rabbit raisers are working as self-employed and mostly working in a sole proprietorship or family business. It was followed by the raisers affiliated in government sector with 25%. There was an equal percentage of the respondents who are working in the clerical support, service sector and agriculture industry. This means that majority of the respondents have a primary job with rabbit farming as an alternative source of income which corresponds to 91.67%. Funding-capital and lack of knowledge are factors that hinder the commercialization of rabbit especially in other developing countries. [21].

**Table 1.** Personal characteristic of the respondents from the three area of study (n = 24).

Personal Characteristics of Rabbit Raisers N = 24	Tigaon		Goa		San Jose		Total	
	F	%	F	%	F	%	F	%
<b>Gender</b>								
Male	5	20.83	6	25	6	25	17	70.83
Female	3	12.50	2	8.33	2	8.33	7	29.17
<b>Civil Status</b>								
Single	4	16.67	3	12.5	5	20.83	12	50.00
Married	4	16.67	5	20.8	3	12.5	12	50.00
<b>Education</b>								
Elementary Level	0	0	0	0	0	0	0	0
Secondary Level	1	4.17	4	16.7	1	4.17	6	25.00
Skilled/Vocational	0	0	1	4.17	0	0	1	4.17
College Level	5	20.83	2	8.33	7	29.17	14	58.33
Post-Graduate	2	8.33	1	4.17	0	0	3	12.50
<b>Occupation</b>								
Government Employee	4	16.67	1	4.17	1	4.17	6	25.00
Self-employed	2	8.33	5	20.83	2	8.33	9	37.50
Clerical Support Worker	1	4.17	0	0.00	2	8.33	3	12.50
Service Worker	0	0.00	1	4.17	2	8.33	3	12.50
Agriculture	1	4.17	1	4.17	1	4.17	3	12.50

### 3.2. Farming Characteristics of the Rabbit Raisers

**Table 2** presents the respondents' number of years engagement in rabbit farming. With a 70.8%, it can be concluded that majority of the respondents are raising rabbits for about 1 - 2 years. It was followed by 3 - 4 years with 24.6%. This means that majority of the rabbit raisers in San Jose have just started a year ago. It was observed that the pandemic was one of the factors in pursuing rabbit farming. Having a companion animals like rabbits are beneficial to owners for it reduces loneliness and stress through having access to a perceived source of love, support, comfort, security and stability [22]. However it is important to know that the rabbit industry started in Partido around 5 years ago with 4.18% and gradually increased year later because of fast reproduction or breeding capability of rabbits. The period of pregnancy of a rabbit is 31 days and a doe can produce from 1 to 12 keats each time she gives birth. A doe can be pregnant again within a few days of giving birth. However, it is not advisable for a doe to become pregnant straight after giving birth. It is better to mate the doe when her young (litter) are 4 weeks old so that they are 8 weeks old when the next litter is born. In this way one doe can produce 6 litters a year [23].

**Table 2.** Respondents' number of years engagement in rabbit farming.

Personal Characteristics of Rabbit Raisers N = 24	Tigaon		Goa		San Jose		Total	
	F	%	F	%	F	%	F	%
<b>Years in Rabbit Industry</b>								
1 - 2 years	6	25.00	3	12.5	8	33.3	17	70.8
3 - 4 years	2	8.33	4	16.17	0	0	6	24.6
5 - 6 years	0	0.0	1	4.18	0	0	1	4.18
<b>Purpose of Rabbit Farming</b>								
Leisure/pet	6	25.00	6	25.00	6	25.00	18	75.00
Manure	0	0.00	0	0.00	0	0.00	0	0.00
Meat for home	0	0.00	0	0.00	1	4.17	1	4.17
Selling	2	8.33	2	8.33	1	4.17	5	20.83
<b>First Rabbit Acquisition</b>								
Breeder	6	25.00	7	29.17	6	25.00	19	79.17
Pet shop	0	0.00	0	0.00	0	0.00	0	0.00
Family/friend	2	8.33	1	4.17	2	8.33	5	20.83

With a 75%, it can be concluded that majority of the rabbit raisers started to take care of rabbit for the purpose of leisure or pet while 20.83% responded that selling for communalization. This means that majority of the respondents started rabbit raising for the purpose of leisure but latter become an income generation for they have been selling keats or litters for a prices ranges from 300 - 500 pesos once the supply is available. Despite the main objective of petting, it was observed that some had slaughtered their rabbits for home consumption as an alternative healthy meat especially for those who have comorbidities and observe proper diet. In this context, rabbit meat is edible. It was supported by the study of Gacern and Lebas that rabbit meat is consumed in all areas of Algeria particularly in the Central and Eastern regions by the farmers and their families [24].

The majority of the farmers responded that they acquire their first set of rabbit from nearby breeders with 79.17% While 20.83% said that it was given by a family member as a gift or by accident until such time they embraced raising them. It is interesting to note that no one bought rabbits from a pet shop.

### 3.3. Rabbit Breeds Available in the Area

**Table 3** presents the identified breeds available in the area. The most dominant rabbit breed available in the area was New Zealand White (NZW) with 79.17% and followed by Lion Head (LH) which had 58.33%. With the 37.50%, it can be concluded that farmers have started trying to crossbreed Californian White (CW) and NZW. In Goa, there was an equal percentage of the respondents who have NZW and LH with corresponding 25%. Likewise, in San Jose the NZW had the highest responses with 25% followed by the cross local bread with 20.83%. The NWZ and Californian rabbits were the most dominant reported breed

across countries that are appropriate for meat production due to their good growth characteristics and a high meat ratio [25]. It was observed that one of the good practices of the farmers is profiling of their rabbits which records the rabbits' birthday, parent, gender etc. in order to avoid inbreeding. According to Onifade (1999), lack of breeding records may worsen the development of a reliable breeding program [26].

### 3.4. Housing Preference and Characteristics

**Table 4** shows the housing preference and characteristics of existing rabbit raisers in Partido. Majority of the respondents were small scale raisers who engage in rabbit backyard farming with 95.83%. While only few have fully converted their available land into farm with 4.17%. It was observed that majority of the rabbit cages were made from combinations of wood and iron sheets which are low-cost and easily available in the area. During the interview and ocular visit, it was found-out that hutches should be off from the ground for good ventilation, easy feeding and cleaning management and prevention from predators like rats, dogs, snakes. The poor construction design of rabbit hutches is due to lack of financial capability and limited access to technical information [26].

**Table 3.** Breeds available in the area.

BREEDS AVAILABLE	Tigaon(8)		Goa(8)		San Jose(8)		Total Weighted Mean	
	F	%	F	%	F	%	F	%
New Zealand	7	29.17	6	25.00	6	25.00	19	79.17
Cali White	4	16.67	1	4.17	1	4.17	6	25.00
Lion Head	4	16.67	6	25.00	4	16.67	14	58.33
Flemish Giant	2	8.33	0	0.00	0	0.00	2	8.33
Holland Loop	1	4.17	0	0.00	0	0.00	1	4.17
Fuzzy Loop	3	12.50	0	0.00	0	0.00	3	12.50
English Spot	1	4.17	0	0.00	0	0.00	1	4.17
Lion Loop	1	4.17	0	0.00	1	4.17	2	8.33
Chinchillah	2	8.33	0	0.00	0	0.00	2	8.33
Havannah	1	4.17	0	0.00	0	0.00	1	4.17
Holland Dew	1	4.17	0	0.00	0	0.00	1	4.17
Dutch	0	0.00	0	0.00	0	0.00	0	0.00
Cross	3	12.50	1	4.17	5	20.83	9	37.50

**Table 4.** Housing preference and characteristics of existing rabbit raisers in Partido.

HOUSING (n = 24)	Tigaon(8)		Goa(8)		San Jose(8)		Total	
	F	%	F	%	F	%	F	%
farm	1	4.17	0	0.00	0	0.00	1	4.17
backyard	7	29.17	8	33.33	8	33.33	23	95.83

### 3.5. Feeding Preference

**Table 5** presents the feeding preference of the respondents. Based on the data, almost all of the raisers preferred pellets while others preferred greens with 91.67%. From the interview, it was observed that the raisers had the following good-feeding practices: air drying of green forages for one-day, 20 grams of pellets are given usually in the morning and afternoon while unlimited greens for the rest of the time, Integra 300 and probits are the preferred pellet brands. In Nigeria, it was reported that rabbits in a small farming systems were fed on crop residues, weeds, waste fruits, vegetable and poultry droppings. The diets of rabbits are primarily forages, legumes, and grasses supplemented with agricultural by products and kitchen wastes [27].

### 3.6. Trainings Attended

**Table 6** presents the trainings attended and the willingness of the respondents to join rabbit raisers organization. From the given data, it can be concluded that majority of the respondents have basic training on rabbit farming and production with a total weighted mean of 62.50%. It was followed by 54.17% who have basic training in meat processing while 41.67% had no training at all. Based on the interview the training was given by the Tierra Del Menor that was conducted in Goa, Camarines Sur in the midyear of 2021. Some training were openly given for free in a form of webinar while some have just rely in the use of browsing and research to reinforce their knowledge in rabbit farming in general. Training and development aims to improve one's capacity, capability, performance, and productivity through acquisition of new knowledge, skills, and competencies [28].

**Table 5.** Feeding preference of the respondents.

FEEDING	Tigaon(8)		Goa(8)		San Jose(8)		Total	
	F	%	F	%	F	%	F	%
greens	7	29.17	7	29.17	8	33.33	22	91.67
pellets	8	33.33	8	33.33	8	33.33	24	100.00

**Table 6.** Trainings attended and the willingness of the respondents to join rabbit raisers organization.

TRAININGS ATTENDED	Tigaon(8)		Goa(8)		San Jose(8)		Total Weighted Mean	
	F	%	F	%	F	%	F	%
farming and production	6	25.00	4	16.67	5	20.83	15	62.50
meat processing	6	25.00	3	12.50	4	16.67	13	54.17
none	1	4.17	6	25.00	3	12.50	10	41.67
MEMBERSHIPS								
Yes	3	12.50	2	8.33	3	12.5	8	33.33
No (willing to join)	3	12.5	6	25	4	16.66667	13	54.16667



In terms of membership in organization, it was found out that 54.16% do not belong to any rabbit related organization while 33.33% are members of Facebook Rabbit Related Groups such as: Bicol Rabbit Raisers Association and Partido Rabbitry Association. However, it is interesting to note that majority of the respondents who are not members are willing to join a rabbit organization or association.

#### **4. Conclusion**

Findings revealed that the rabbit production industry in Partido is continuously growing with an average of 1 - 2 years of existence. The majority of the rabbits' raisers were composed of young men who have reached college and currently working as self-employed. Raisers started taking care of their rabbits for the purpose of pets or leisure until such time they consider shifting their production for the purpose of selling and personal consumption. In terms of housing preference, the majority was engaging in backyard farming with 95.83% and the hutches were mostly made of combined iron sheets and woods. The raisers preferred feeding pellets while others preferred greens with 91.67%. The majority had basic training in rabbit production but less in meat processing. Furthermore, it was found that there is no profound established and accredited rabbit related group cooperative in Partido. Raisers normally watch YouTube vlogs and join Facebook groups to reinforce their knowledge.

#### **5. Recommendations**

To address the challenges encountered by the rabbit raisers in Partido, the researchers suggest the following:

- 1) For the Department of Agriculture and or the State Universities and Colleges, to conduct an information dissemination or awareness campaign about the edibility and health advantages of rabbits as alternative meat in a form of webinar and extension activities;
- 2) For the Local Government Unit, Department of Trade and Industry and Academes, to conduct training and seminars on rabbit production, and meat processing for raisers who want to pursue value-added products on rabbit meat.;
- 3) For the DA Bureau of Animal Industry, to conduct orientation training on rabbit carcasses that would not violate any regulation pertaining to animal cruelty;
- 4) For the rabbit raisers, to have proper documentation on rabbit production including rabbit profile and inventory of income and expenses;
- 5) For the rabbit raisers, to establish accredited rabbit-raisers association or cooperation for the ease of future support and assistance from the sponsoring agencies;
- 6) For future researchers, to conduct the same study that will cover a larger population and the whole area of Partido or Camarines Sur; and
- 7) For the Municipal Agriculture Office of Goa and San Jose, to come up with the list or profile of rabbit raisers which could be baseline information for future

researchers in conducting studies related to rabbits.

## Conflicts of Interest

The author declares no conflicts of interest.

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