

# PAST AND PRESENT RESEARCH ON RABBIT PRODUCTION AT THE IRIAP

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during his presentation





## **Past and Present Research on Rabbit Production at The Indonesian Research Institute for Animal Production**

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### **ABSTRACT**

Rabbit production has been increasing in Indonesia since the last 10 years. It was increasing since the abruptly breakout of the bird flu. Substantial numbers of household poultry farmers in the village changed their poultry to rabbits. Nationally, small rabbit farming were introduced in the 1980s, as a Government program to alleviate meat protein consumption of the community in rural areas. Since the introduction and widespread distribution of rabbits in the 1980s, rabbit has become an interest for research in Indonesia. However, since rabbit has not been considered as a high priority animal to be developed, its research funds, hence, numbers of its researches were limited. More than six strains of rabbit were available in Indonesia. The most number of strains were found in our research institute and the other were found in small holder farms throughout the country. Researches were mainly dealt with forage and by-product feeds utilization for meat production. In the late 80s and early 90s, when Rex and Satin were introduced, researches were redirected to the production of quality fur including the tanning process. In the late 90s and early 2000s, successful attempt was achieved to produce a breed of rabbit that has Rex-Satin like-fur (named as Reza), with soft, uniform and shiny fur. This breed (Reza) however, was susceptible to enteritis and rather slow in growth. In the last three-four years, the interest of farming rabbits in various areas, although at very small scale farming (5-20 does), increases tremendously. This increase interest may partly be caused of market is widely open, price of rabbit is high, widespread of Avian Influenza, high price of poultry feed and then rabbit farming become an alternative for family who used to be raising local chicken. Problems faced by rabbit farmers are low availability and quality of breeding stock, expensive premixed diet for intensive raising, low availability of good quality forages and high incidence of enteritis. Mortality of 20-40% prior to and 4 weeks after weaning often occurs with the rabbit in small scale farming. Currently, research is directed to have productive Rex, Satin, Reza and produce a medium-big size Reza, reduce mortality through nutrition and possible use of some herbs known to prevent diarrhoea and improve village rabbit management.

**Key Words:** Rabbit, Research, Indonesia

### **INTRODUCTION**

Rabbit has been raised for a long time by family in the villages. Rabbits were, perhaps kept as pet running around in the house. There was no report on rabbit meat consumption although in the upland area we could find people selling hat from rabbit fur. Introduction of imported exotic rabbit to small farmers in Indonesia, mostly in Java, was in the early 80s by the government. The aim was to improve family meat consumption, a good and *halal* meat (the meat that is allowed to be eaten by Moslem), in the rural areas. However, in the late 80s the program fail the villagers put a high price for rabbit (as breeding stock), while market for meat had not yet developed. Besides, 'bunny syndrome' did exist and effort to promote it was scarce.

Research on rabbit production was somewhat intensified in the late 80s, irrespective of small budget provided by the government. The aims of the research was directed to explore value added of the rabbit through the production of good quality fur, through the introduction of the Rex and Satin rabbits. Fur has been promoted as a material for leather and fur industry, such as for coat, handycraft and toys making. Research was pursued not only on the production but also on post harvest aspect, especially for fur preparation.

Recently, since the outbreak of avian influenza in Indonesia followed with government regulation on killing so many chicken due to suspected death of 105 people throughout the country, rabbit has been becoming popular especially among the

**Table 1.** Number of research activities carried out at the Indonesian Research Institute for Animal Production

Year	Aspect of research					Total
	Management	Breeding and reproduction	Nutrition	Post harvest	Health	
1980's	9	1	13	2	3	28
1990's	9	2	18	2	6	37
2000's		6	5		6	21
Total	18	9	36	4	15	86

**Table 2.** Average amount of funds allocated by the government on rabbit research activities

Year	Average amount of budget allocated for rabbit research	
	Rupiahs/year	US dollars/year
1985-1998	40 millions	4,000
1998-2002	None	None
2003-2007	60 millions	6,000

villagers, who might have been trying to avoid avian influenza, while at the same time they also looked for good meat to consume.

There was no report on the AI infecting rabbit or even when they were challenged by AI virus in an experimental condition, rabbit did not show any clinical illness or death (Darminto 2007).

### GOVERNMENT BUDGET FOR RABBIT RESEARCH

Through IRIAP the government put a small budget for the rabbit research in the late 80's, covering some aspect of nutrition, managements, breeding, health, and post harvest. A numbers of research activities have been carried out since (Table 1). Other than IRIAP, some universities also do some research in rabbit production (*e.g.* University of Padjadjaran- Bandung, University of Diponegoro-Semarang, University of Jenderal Sudirman-Purwokerto). However, IRIAP could be the only institute that carry out rabbit research continuously.

Most research activities were carried out in the rabbit station of IRIAP at Ciawi, Bogor, and a small number were collaborated with small holders rabbit farms in the villages in West and Central Jawa. The amount of research fund provided by the government is

shown in Tabel 2. Government budget on rabbit research was considered very small compared with the budget for chicken and ruminant research. However, to some extent, its results have been contributing considerable technologies needed by small holder rabbit farms throughout the country.

In the years to come IRIAP has to put some effort to convince the government especially the Agency for Agricultural Research and Development, that rabbit will significantly make a substantial contribution to the increase of meat consumption especially in the villages. Rabbits have good opportunity since they are able to produce cheap, good quality meat. Furthermore, in facing the increasing price of grain or grain by products, rabbits have more advantage and can be well developed in forages.

## RESULTS DISCUSSIONS

### Breeding and reproduction

There were around 12 breeds of rabbit recorded in Indonesia (Raharjo et al. 2005). Number of breeds kept in IRIAP were the most, whilst farmers kept the most five breeds. Phenotypic characteristics of each breed are presented in Table 3. Variation colors were found in almost all breeds except New Zealand

White. Further, Raharjo et al. (2005) also reported morfometric characters of mature rabbit breed in Indonesian. The characteristics of rabbit at this institute could be considered as a represent the characteristics of rabbit found kept by the farmers throughout the country, except local rabbit, which was a little bit smaller compared with other meat-type breed of exotic rabbit. Morfometric characteristics of Indonesian rabbit are presented in Table 4.

Reproductive traits of breeds of rabbit in Indonesia, which were mostly reported by Raharjo et al. (2005) were presented in Table 5. The sortest partus interval was shown by breed of Tan (38 days) dan the longest was by Reza and Angora (45.4 days). Length of pregnancy was almost the same for all breeds. Mini Rex was the poorest litter and weaning sizes among all breeds observed.

**Table 3.** Phenotypic traits of rabbit breeds in Indonesia

Rabbit breeds	Phenotypic traits
Angora	Colour of fur: Pure white, black-white, mix of brown-golden and yellow-grey. Broken ears, flop with oval form and round face
Crossing	Colour of fur: Mix of castor, grey, black and pure. Oval ears lobe standing beside the head and pears form like face
Lion	Black stripes color of fur. Oval ears lobe standing beside the head and pears form like face
Lop	White and brown fur with long, curve and fall oval-ears. Completely round face
Mini Rex	Three colors (white-brown-white) fur with standing and oval ears. Face is round
NZW	Pure white fur with standing and oval ears. Face is round
Rex	The color of fur is vary from two mix colors of black and white, castor, chincila (white-black-brown) to pure white. Standing, oval and narrow ears with round face
Reza	Reza has many colors of fur such as pure white, the mix of brown and black (harlequin), grey and pure black. Standing and oval ears with round face dominate the chracteristic of Reaza
Satin	Fur colors are vary from pure white, pure black to the mix of grey and white. Standing, oval and narrow ears are often found with round face
Tan	Pure black of fur, standing, oval and narrow ears with round face are the characteristics of this breed
Felmish giant	Color of fur were vary covering chinchilla, grey, brown, white-brown, black-brown and white-black. Standing and oval ear with round face like pears
Local	Black-white fur with standing and oval ears and round face like pears

**Source:** Brahantiyo et al. (2007)

**Tabel 4.** Morfometric traits of breeds of rabbit in Indonesia

Breeds	Body measures													
	Body weight (g)		Chest girth (cm)		Body length (cm)		Neck circular (cm)		Tail length (cm)		Tail circular (cm)		Ear length (cm)	
	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀
Angora	1884	1859	30.8	28.9	36.6	36.8	22.6	22.6	5.40	5.60	3.80	4.00	11.4	11.0
Cross	2116	1842	31.8	32.0	39.4	39.6	25.6	25.2	4.60	4.80	2.80	3.40	11.6	11.6
Lion	2250	2118	36.0	24.3	34.0	34.5	26.0	23.8	5.00	5.00	3.00	3.00	12.0	11.5
Lop	2221	1942	32.7	22.0	34.3	32.0	21.7	22.0	6.00	5.00	4.00	4.00	11.0	11.0
Mini Rex	1087	2112	25.0	29.0	31.0	30.0	25.0	14.0	7.00	3.00	4.00	2.00	10.0	10.0
NZW	3342	3248	35.4	33.6	40.2	37.4	23.2	20.6	5.40	5.60	4.60	4.20	11.0	10.9
Rex	3082	3275	27.9	27.3	40.4	35.2	21.4	21.4	6.70	6.70	4.40	3.80	11.2	11.4
Reza	3062	3177	32.0	32.2	39.4	40.4	25.6	25.6	3.80	4.20	3.00	3.20	10.8	11.0
Satin	2797	3055	29.0	30.6	34.8	34.6	22.8	22.2	5.60	5.60	3.40	4.20	11.5	11.4
Tan	2480	2320	25.0	24.0	36.0	32.0	30.0	26.0	6.00	7.00	4.00	4.00	10.0	11.0
Local	n.a.	1850	n.a.	28.0	n.a.	35.0	n.a.	21.0	n.a.	n.a.	n.a.	n.a.	n.a.	11.0
California	2600	2750	29.0	28.0	40.0	42.0	17.0	16.5	n.a.	n.a.	n.a.	n.a.	13.0	14.5
Flemish giant	2500	3314	29.0	29.6	41.0	42.9	18.0	17.6	n.a.	n.a.	n.a.	n.a.	13.0	14.1

n.a.: not available

**Source:** Brahmaniyo et al. (2007)

**Tabel 5.** Reproductive traits of breeds of rabbit kept at IRIAP

Breeds	Partus interval (days)	Length of pregnancy (days)	Litter size (kids)	Weaning size (kids)	Service/concept (times)	Concept rate (%)
Angora	45.4 <sup>A</sup>	31.6	5.0 <sup>AB</sup>	3.8 <sup>AB</sup>	1.39	26.7 <sup>AB</sup>
Cross	39.8 <sup>AB</sup>	32.4	6.4 <sup>AB</sup>	5.2 <sup>A</sup>	1.94	44.9 <sup>A</sup>
Lion	41.0 <sup>AB</sup>	32.3	4.8 <sup>AB</sup>	3.0 <sup>AB</sup>	1.40	28.9 <sup>AB</sup>
Lop	42.0 <sup>AB</sup>	32.0	7.0 <sup>A</sup>	3.0 <sup>AB</sup>	1.50	33.3 <sup>AB</sup>
Mini Rex	45.0 <sup>A</sup>	32.0	4.0 <sup>B</sup>	2.0 <sup>B</sup>	1.40	28.6 <sup>AB</sup>
NZW	38.2 <sup>B</sup>	33.4	6.8 <sup>A</sup>	5.4 <sup>A</sup>	1.30	22.1 <sup>AB</sup>
Rex	39.4 <sup>AB</sup>	32.0	6.4 <sup>AB</sup>	5.0 <sup>A</sup>	1.90	31.2 <sup>AB</sup>
Reza	45.4 <sup>A</sup>	32.6	6.4 <sup>AB</sup>	3.4 <sup>AB</sup>	1.35	25.3 <sup>AB</sup>
Satin	41.6 <sup>AB</sup>	32.4	4.6 <sup>AB</sup>	3.6 <sup>AB</sup>	1.35	25.3 <sup>AB</sup>
Tan	38.0 <sup>B</sup>	33.0	6.0 <sup>AB</sup>	4.0 <sup>AB</sup>	1.13	11.1 <sup>B</sup>

Value with different superscripts were significantly difference (P<0.01)

Special attention was put on Rex and Satin rabbits. Started in the 1998, an idea to produce a breed of rabbit that has soft, uniform in length and shiny fur was developed (Raharjo et al. 1998). The fur of the breed was formed from a combination of recessive gene *rr* (smooth fur of Reza) and gene *sasa* (shiny fur of Satin) (Prasetyo 1999). This gene traits (combination of two recessive genes) would not produce variation of the traits, because the segregation of those genes would not produce new character combination. Thus all of offspring would have smooth and shiny fur. This specific phenotype trait would help the selection program. Both Rex and Satin breeds were brought to IRIAP in 1996, through a cooperation with a company.

Evaluation on semen quality of those breeds of rabbit, showed that semen volume of Rex, New Zealand White and Flemish Giant were 0.9, 1.92, and 1.97 mls, respectively. While their sperms were 365,8; 497,6 and 428,9 million/ml and pH of 7.6; 7.7; and 8.2 respectively (Sastrodihardjo et al. 1985).

Current topic of Indonesian research:

1. Open nucleus breeding program, artificial insemination, mating system, semen quality.
2. Nutrition

- Local forage quality, vegetable waste products
- Concentrate feed, probiotik
- Requirements (energy, protein, fiber)
- Feeding system

### 3. Management

- Existing performance under traditional keepings
- Raising in upland, medium areas by small farmers in Jawa
- Weaning age, nest box, temperatures, fostering, fattening, number of does kept

### 4. Post harvest

- Fur, meat and meat products

### 5. Health

- General diseases, skin diseases, coccidiosis, diarrhea

## RABBIT STRATEGIC RESEARCH PLAN FOR 2005-2009

- Goal:  
Building rabbit agribusiness based on appropriate technology for industrial scale
- Potentials:
  - Small, cute, edible animal
  - Prolific, eating simple forages
  - Used for meat, fur, manure and pet
  - Synthetic adaptive breed

**Table 6.** Conditions

Variables	Existing (2005)	Target (2009)
Breed	Rex, Satin, NZW, FG, Reza	Crosses
Concept rate	60-70%	80%
Litter intervals	59-70 d	50 d
Kindling litter size	5.2-8.5 kits	>7.5 kits
Weaning size	3.2-6.1 kits	>7 kits
Weight gain, g/head (2-4.5 months)	15-20	30
Slaughter weight	2.5-3.2 kg	3.5-4.0
Mortality	20-40%	<15%
Skin area	30-36 cm <sup>2</sup>	>48 cm <sup>2</sup>
Fur quality	Low-high	Mod.-High

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