

# Hasil IThenticate\_3rd SRICOENV\_Fitra Yosi

*By Fitra Yosi*

# The Effects of Probiotic and Organic Acid from Hymenache Acutigluma Silage to The Weight of Small Intestine and Caeca in Pegagan Ducks

Sofia Sandi<sup>1</sup>, Fitra Yosi<sup>1</sup>, Eli Sahara<sup>1\*</sup>, Meisji Liana Sari<sup>1</sup>, Aptriansyah Susanda<sup>1</sup>, Asep Indra Munawar Ali<sup>1</sup>, Angriawan NTP<sup>1</sup>, Gita Nuzurlia<sup>1</sup>, Nasir Rofiq<sup>2</sup>  
{elisahara.unsri@gmail.com}

<sup>1</sup>Department of Animal Science, Faculty of Agriculture, University of Sriwijaya  
<sup>2</sup>Badan Riset dan Inovasi Nasional BRIN, Indonesia

4

**Abstract.** The aims of the research to determine the effect of probiotics and organic acids from (Hymenachne acutigluma) silage to the percentage of small intestine weights and caeca. This research was held on two months at the experimental fary Faculty of Agriculture, Sriwijaya University. Data analyzed in description by 6 treatments and 4 replications. There is 3 Pegagan duck as a variable unit: P0 (control), P1 (diet + organic acid), P2 (diet + probiotic), P3 (diet + tetracycline), P4 ((diet + organic acids + probiotics)), P5 ((diet + organic acid + probiotic + tetracycline)). The observed variables were small intestine weight, duodenum weight, jejunum weight, ileum weight and caeca weight. The results of this research indicate that the effect of probiotic and organic acid from (Hymenachne acutigluma) silage can increase the weight of the small intestine, duodenum, jejunum, ileum, caeca and total bacteria acid lactat. The conclusion of this research is the provision of probiotics and organic acids from (Hymenachne acutigluma) silage can increase the weight of the small intestine, duodenum, jejunum, ileum, caeca and total bacteria acid lactat

**Keywords:** caeca, pegagan duck, probiotics, small intestine, organic acid

## 1. Introduction

Pegagan Ducks is germ plasm South Sumatra, who came from villages koto daro II kecamatan Rantau Panjang. Pegagan ducks has advantages such as adult weight ranges 2 kg and heavy eggs ranges 70g This was a type of pegagan ducks that can produce eggs and meat, but its productivity is still low, one effort to improve productivity animal is improve the quality of the feed. The problems that often occurred during this is still a lot the use of antibiotics as growth will gain, it is going to any negative impact on animal because of the residue that could endanger the consumers. Come up with an alternative that could be done by to replace the use of an antibiotic with probiotics and organic acids.

Probiotics is microbes living that are capable of developing inside the intestines and benefit the host. The use of probiotics can serve to set composition to be microflora by reducing the number of pathogenic microorganisms in the intestines. [1] is that the use of probiotics containing lactic acid bacteria 3.6 ml capable of being employed by good in the digestive tract. The results of the study [2] shows that isolate derived from silage Hymenache

acutigluma including in a type of lactic acid bacteria *Lactobacillus plantarum* who can serve as probiotics

The addition of an organic acid that can maintain a balance in the digestive tract by means of maintaining pH of the digestive tract, so that the protein increase. Results of the study [3] shows that lactic acid bacteria derived from silage *Hymenache acutigluma* capable of living in a condition of pH low and high. The addition of an organic acid on the water drinking or poultry feed it has been proven to improve the absorption of with improve the functioning an enzyme digestive so it influences increase in digestion and a 13 ption of especially fibers and protein [4]. Based on this it is necessary to conduct research on the effect of giving probiotics and organic acids to the weight of small intestine and caeca Pegagan duck.

2

## 2. Materials And Methods

### 2.1 Materials

Material used in research is organic acids and lactic acid bacteria resulting from *Hymenache acutigluma* silage. Rations consisting of maize, bran rice, concentrates, MBM, soybean, metionin, and lysine who get mixed until homogeneous (Table 1 and 2). pegagan ducks age six months as many as 72 tail.

**Table 1.** Composition feed ingredients

Feed Ingredients	Usage (%)
Corn	43.00
Rice Bran	19.80
Concentrate	19.10
Soybean	12.20
MBM	4.90
Methionine	0.40
Lysine	0.60
Total	100

**Table 2.** The nutritional content of the research ration

Feed Ingredients	Usage
Dry ingredients (%) *	89.52
Organic ingredients (%) **	41.52
Crude Fiber (%) *	11.64
Crude fat (%) *	5.91
Crude protein (%) *	23.97
Nitrogen(%)***	0.67
Calcium (%) ***	2.86
Potassium (%) ***	0.45
Phosphor (%)***	1.08
Energy Metabolism (kcal / kg) **	2771.08

Note: \* Nutritional requirements based on analysis results in the nutrition and animal feed laboratory (2019)

\*\*Nutrition needs based on ration calculation results

\*\*\* Nutrition needs based on the results of analysis in the chemical, biological and fertility Laboratories

## **2.2 Research Methods**

### **2.2.1 Probiotic**

Making probiotics in this study using the [5] . Lactic acid bacterial isolates that have been obtained are then cultured in MRSB (deMann Rogosa Sharpe Agar) in the form of liquid / broth and incubated for 48 hours. The culture was centrifuged at 3000 rpm for 15 minutes to separate the supernatant and substrate. The substrate was added with 5% skim milk and maltodextrins (w / w). Next, spray dried with a temperature of 160-180°C.

### **2.2.2 Organic Acid**

According to the modified State method (2009), after 21 days the silage is harvested and then opened and extorted with the addition of distilled water (1: 1). The obtained silage liquid is then put into a bag made of cloth to separate the liquid between the silage, then the silage juice is taken to check the value of the acidity (pH) using a pH meter. If the silage pH is around 3.8-5 then silage juice can be used as organic acid. Organic acids that have been taken are put into plastic bottles to be stored in the refrigerator.

### **2.2.3 Livestock raising**

Maintenance of Pegagan ducks is done for 60 days. Provision of treatment for the use of organic acids is mixed in drinking water, probiotics and tetracycline mixed in feed. During the maintenance of the ration and drinking water is given *adlibitum*.

### **2.2.4 Sampling**

Before cutting, ducks are fasted for 6 hours and only given drinking water. Cutting is done by severing the blood vessels (veins and arteries), food channels and airways then blood is removed by hanging for 50-120 seconds, then immersion in hot water for 5-30 seconds with the aim to facilitate the process of hair removal. After hair removal, the legs, head, neck and internal organs are removed and the small intestine is removed and wiped off. Small intestinal fluid and wipe removed first then cut and measured its weight.

## **2.3 Data Analysis**

The variables observed in this study were small intestine weight, duodenum, jejunum, ileum and wasted weight [6] . Data were analyzed descriptively with 4 replications and 6 treatments consisting of

P0 = ration without treatment (Control)

P1 = ration basal + organic acid

P2 = ration basal + probiotics

P3 = ration basal + tetracycline

P4 = ration basal + organic acid + probiotics

P5 = ration basal + Organic acid + Probiotics + Tetracycline

### 3. Results and discussion

#### 3.1 Results

The results of giving probiotics and organic acids from copper silage grass silage to the weight of small intestine, duodenum, ileum and jejunum and caeca Pegagan duck can be seen in Table 3.

Table 3. Average percentage weight of small intestine (duodenum, jejunum ileum) and caeca pegagan ducks.

Treatment	Small Intestine	Duodenum	Jejunum	Ileum	caeca
P0	1.94 ± 0.12	0.35 ± 0.04	0.83 ± 0.03	0.75 ± 0.02	0.32 ± 0.02
P1	2.00 ± 0.16	0.35 ± 0.02	0.84 ± 0.11	0.76 ± 0.05	0.32 ± 0.03
P2	2.19 ± 0.14	0.40 ± 0.05	0.92 ± 0.08	0.86 ± 0.09	0.38 ± 0.07
P3	2.04 ± 0.20	0.39 ± 0.05	0.91 ± 0.13	0.78 ± 0.18	0.36 ± 0.04
P4	2.43 ± 0.20	0.45 ± 0.03	1.08 ± 0.10	0.89 ± 0.09	0.43 ± 0.03
P5	2.03 ± 0.11	0.37 ± 0.02	0.86 ± 0.10	0.76 ± 0.10	0.32 ± 0.03

Note: P0 = (control), P1 (ration basal + organic acid), P2 (ration basal + Probiotic), P3 (ration basal + Tetrasilin), P4 (ration basal + organic acid + probiotic), P5 (ration basal + organic acids + Probiotics + Tetrasilin).

##### 3.1.1 Small Intestine Weight

The results of the average percentage of Pegagan ducks small intestine weighing ranged from 1.94-2.43%. The lowest average percentage of small intestine weight in this study is in control (P0) while the highest average value is in the provision of probiotics and organic acids (P4). This indicates that the administration of probiotics and organic acids from silage of copper clumps works optimally in the small intestine so that it can influence the weight of the Centella asiatica ducks, allegedly giving probiotics can produce short chain fatty acids which are the product of the production of Lactic Acid Bacteria (LAB). [7] stated that short chain fatty acids are the result of the production of *Bifidobacteria* and *Lactobacilli* bacteria. Organic acid also has antibacterial properties that emphasize the growth of pathogenic bacteria that are in the small intestine so that the process of absorption of nutrients will go well. This is in line with the opinion of [8] which states that organic acids can emphasize the growth of pathogenic bacteria because organic acids can reduce pH in the small intestine and have antibacterial properties.

##### 3.1.2 Weight of the Duodenum

The results of the study showed the average percentage of duodenal weight ranged from 0.35% - 0.45. The lowest mean percentage of duodenal weight in this study is control treatment (P0) while the highest average value is in the treatment of probiotics and organic acids (P4). Probiotics and organic acids can work well, thereby increasing the absorption of nutrients in the duodenum. Increased absorption of nutrients due to the provision of probiotics and organic acids stimulates the growth of intestinal epithelial cells so that the process of absorption of nutrients will increase. This is in accordance with [9] who stated that short chain fatty acids produced by probiotics will affect the growth of intestinal epithelial cells which will increase the process of absorption of nutrients in the duodenum. Provision of probiotics and organic acids that can increase the activity of lactic acid bacteria will stimulate the growth

of villi in the intestine and ultimately will increase the absorption of nutrients in the duodenum [10]. Growth of the villi in the intestine will increase the weight of the duodenum. This can be seen from the results of research showing that the administration of probiotics and organic acids which can increase the growth of villi in the duodenum will increase the percentage of duodenal weight.

### 3.1.3 Jejunum Weight

The results of the average percentage of jejunum weights ranged from 0.83-1.08%, these results are still in the normal range it can be compared with the results of [11] research, which is 0.87-0.84%. The lowest average value of jejunum in this study was control treatment (P0) while the highest average value was in the provision of probiotics and organic acids (P4). An increase in jejunum is due to the administration of probiotics and organic acids from silage of copper clumps that work well on jejunum thereby expanding the absorption area in the jejunum. The increased area of absorption in the jejunum will be followed by an increase in the growth of villi in the jejunum. This is in accordance with [12] which states that the increase in intestinal villi height in jejunum is in line with the good absorption of nutrients in jejunum. Probiotics and organic acids are able to control the state of microflora in the jejunum so as to increase the thickness of the mucosal tunica in the jejunum wall. Provision of probiotics and organic acids in this study has been shown to increase nutrient absorption which will ultimately affect the weight of the small intestine in the jejunum.

### 3.1.4 Ileum Weight

The results of the average weight of jejunum research ranged from 0.75% - 0.89%, this result is still in line with the results of [11] the effect of giving probiotics from copper clump grass silage on small intestine weights and wiped with an average percentage of ileum weights 0.82% - 0.89%. The lowest mean ileum value in this study was in the control treatment (P0) while the highest mean value was the giving of probiotics and organic acids (P4). An increase in the average percentage of ileum weight shows that probiotics and organic acids from silage of copper clump grass still work optimally although ileum does not play a role in the process of nutrient absorption because the absorption process of nutrients in the small intestine occurs mostly in the duodenum and jejunum [13].

### 3.1.5 Caeca Weight

The results of the study showed that the average percentage of weights ranged from 0.32 to 0.43%, this result is in line with the results of the study of [14] profile of the digestive tracts of female teal ducks that were given additional feed in combination with papaya leaf extract and lactic acid bacteria with an average percentage of 0.37% - 0.40%. The lowest mean percentage of weight was in the control treatment (P0) while the highest mean value was in the provision of probiotics and organic acids (P4). The average percentage of weight loss has increased because of the provision of probiotics and organic acids from copper clump grass silage that affected the increase. Probiotics and organic acids play a role in multiplying bacteria in the caecum so that it will increase the digestive activity that occurs in ceca [15]. Probiotics and organic acids provide evidence of an effect on wasting weight. This shows that



there is a good absorption of nutrients in the seka due to the widening of the absorption area of nutrients in wipe so that it affects wasting weight. [16] reports that probiotics can expand the absorption area in the intestine so that it makes absorption of nutrients more effective. They are a place of microbial digestion with the aim of digesting undigested nutrients in the small intestine [13]. The work of probiotics and organic acids can increase the work of secreting enzymes in cellulose and hemicellulose in digesting food. Increased wasting in digesting nutrients will be followed by good growth of intestinal villi so that it will affect wasting weight.

#### 4. Conclusion

The conclusion of this research is the provision of probiotics and organic acids can improve the digestive tract organs of the small intestine, jejunum, duodenum, ileum and caeca pegagan duck.

#### References

- [1] Fauziah, A., 2013. Pengaruh Penambahan Vitamin E dan Bakteri Asam Laktat Terhadap Kecernaan Lemak dan Bobot Telur Ayam Kedu Hitam Dipelihara Secara In Situ. *Animal Agriculture Journal*. 2(1), 319-328
- [2] Sandi S ,Fitra Y ,Meisji LS and Nuni G. 2018. The Characteristics and Potential of Lactic Acid Bacteria as Probiotics in Silage Made from *Hymenachne acutigluma* and *Neptunia oleracea* lour. *E3S Web of Conferences* 68, 010 (2018) <https://doi.org/10.1051/e3sconf/2018680101> 1st SRICOENV. 1-4
- [3] Sandi S , Meisji L S , Eli S , Adi S , Miksusanti and Nuni G , Asmak.2019. Acid Resistance Test of Probiotic Isolated from Silage Forage Swamp on in Vitro Digestive Tract. *Indonesian Journal of Fundamental and Applied Chemistry*. 4(1): 15-19
- [4] Abdel-Fattah SA, El-Sanhoury MH, El-Mednay NM, Abdel-Azeem F. 2008. Thyroid activity, some blood constituents, organs morphology and performance of broiler chicks fed supplemental organic acids. *Int. J. Poult. Sci* 7: 215-222
- [5] Bregni, C., Degrossi, J., Garcia, R., Lamas, M.C., Firenstein, R.Y. and D'aquino, M. 2000. Aliginate Microspheres of *Bacillus subtilis*. *Ars pharma* 41(3): 245-248
- [6] Yalcin, S., H. eser, S. Yalcin, S. Cengiz and O. Eltan. 2013. Effect of dietary yeast autolysate (*saccharomyces cerevisiae*) on performance, caracess and gut chaeacteristic, blood profile, and sntibody production to sheep red blood cells broilers. *J. Appl. Poult*, 22:55-61
- [7] Widodo, E, Sjofjan, O dan Wijaya A.Z., 2014. Limbah mie sebagai pengganti jagung dalam pakan ayam pedaging dan pengaruhnya terhadap kualitas karkas. *Jurnal Ilmu dan Teknologi Hasil Ternak*. 5(1), 38-44.
- [8] Emma, M. S. M. W., Osfar, S., Eko, W dan Achmanu. 2013. Karakteristik usus halus ayam pedaging yang diberikan asam jeruk nipis dalam pakan. *Jurnal Veteriner*. 14 (1): 105-110.
- [9] Ahmad, I. (2013). Effect of probiotics on broiler performance. *International Journal of Poultry Science* 5: 593-597.
- [10] Yurong Y., She, R., Zheng, R., Jiang, Y., Effect of probiotics on intestinal mucosal immunity and ultrastructure of cecal tonsils of chickens. *Archives of Animal Nutrition. College of Veterinary Science*. 59(4), 237 – 246.
- [11] Susilo, W. 2017. Pengaruh Pemberian Probiotik dari Silase Rumput Kumpai Tembaga Terhadap Bobot Usus Halus dan Seka. Universitas Sriwijaya. Indralaya
- [12] Awad, W. A., Ghareeb,K. Raheem, A. and Bohm, J., 2012. Effects of dietary inclusion of probiotic and synbiotic on growth performance, organ weights, and intestinal histomorphology of broiler chickens. *Poultry. Science Journal.*, 88, 49-55

- [13] Damron. 2013. Introduction to Animal Science. Prentice Hall. Ohio
- [14] Fandi., A. 2019. Profil Saluran Pencernaan Itik Tegal Betina Yang Diberi Pakan Tambahan Kombinasi Limbah Ekstrak Daun Papaya dan Bakteri Asam Laktak. Jurnal Sains Peternakan 17 (1): 17-23
- [15] Shafiri, S.D., F, Shariatmadari and A. Yaghobfar, 2012. Effect of inclusions of hull- less barley and enzyme supplementation of broiler diets on growth performace, nutrient disgetion and dietary metabolisble energy content. Journal of Central European Agriculture. 13(1): 193- 207
- [16] Winarsih, W. 2010. Pengaruh Probiotik dalam Pengendalian Salmonellosis Subklinis pada Ayam : Gambaran patologis dan performan. Disertasi, Sekolah Pascasarjana Institut Pertanian Bogor.



# Hasil IThenticate\_3rd SRICOENV\_Fitra Yosi

## ORIGINALITY REPORT

7%

SIMILARITY INDEX

## PRIMARY SOURCES

1	Ali Hasan, Javed Iqbal Qazi, Fouzia Tabssum, Ali Hussain. " Midgut health of workers on oral administration of and organic acids ", Journal of Apicultural Research, 2023 Crossref	33 words — 1%
2	<a href="http://www.atlantis-press.com">www.atlantis-press.com</a> Internet	12 words — < 1%
3	<a href="http://www.ncbi.nlm.nih.gov">www.ncbi.nlm.nih.gov</a> Internet	11 words — < 1%
4	<a href="http://jurnal.fp.unila.ac.id">jurnal.fp.unila.ac.id</a> Internet	10 words — < 1%
5	<a href="http://scholarworks.uark.edu">scholarworks.uark.edu</a> Internet	10 words — < 1%
6	<a href="http://animalproduction.net">animalproduction.net</a> Internet	9 words — < 1%
7	<a href="http://digitalcommons.pcom.edu">digitalcommons.pcom.edu</a> Internet	9 words — < 1%
8	<a href="http://journal.unhas.ac.id">journal.unhas.ac.id</a> Internet	9 words — < 1%
9	<a href="http://jwpr.science-line.com">jwpr.science-line.com</a> Internet	

9 words — < 1 %

10 [medpub.litbang.pertanian.go.id](https://medpub.litbang.pertanian.go.id)  
Internet

9 words — < 1 %

11 Ali Hasan, Javed Iqbal Qazi, Fouzia Tabssum, Ali Hussain. "Increased bee venom production in *Apis mellifera* workers on the provision of probiotics and organic acids", *Biocatalysis and Agricultural Biotechnology*, 2023  
Crossref

8 words — < 1 %

12 Enaam A. Abdel-Latif, Zenat A. Ibrahim, Fayiz M. Reda, Mahmoud Alagawany. " Effect of culture filtrate on performance, carcass yield, digestive enzymes, intestinal microbiota and blood constituents of quail ", *Italian Journal of Animal Science*, 2020  
Crossref

8 words — < 1 %

13 [academic.oup.com](https://academic.oup.com)  
Internet

8 words — < 1 %

14 [citeseerx.ist.psu.edu](https://citeseerx.ist.psu.edu)  
Internet

8 words — < 1 %

15 [dokumen.pub](https://dokumen.pub)  
Internet

8 words — < 1 %

16 [mdpi-res.com](https://mdpi-res.com)  
Internet

8 words — < 1 %

17 [prer.hec.gov.pk](https://prer.hec.gov.pk)  
Internet

8 words — < 1 %

18 David W. G. Stanton, Aurelie Manin, Allowen Evin, Kristina Tabbada et al. "Genomic and morphometric evidence for Austronesian-mediated pig

6 words — < 1 %

# translocation in the Pacific", Cold Spring Harbor Laboratory, 2025

Crossref Posted Content

---

EXCLUDE QUOTES	OFF	EXCLUDE SOURCES	OFF
EXCLUDE BIBLIOGRAPHY	ON	EXCLUDE MATCHES	OFF