



**PRODUCT PERFORMANCE
EXAMINATION OF KOTRACT KS50®
COMPLEX MICROBE**



Prepared by

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1. INTRODUCTION

There are many various livestock industries in Indonesia. Based on Tabel 1, poultry industries, especially broiler, is the largest livestock industries in Indonesia. Dairy cow is the largest than dairy goat in dairy milk industries in Indonesia, but dairy cow and goat population is less than livestock population for beef industries, including beef cattle, buffalo, and goat/sheep. West Java has the largest population of broiler as many as 710,79 million chickens and East Java has the largest population of beef cattle, dairy cow, and laying hen as many as 4,82 million cattles, 293,6 hundred cows, and 108,96 million chickens (Ditjen PKH, 2021). For fishery industry, shrimp is large industry in Indonesia because these are one of primary product for export from Indonesia. West Java has the largest population of broiler as many as 710 million chickens (24,32% of national population) in 2020 (Ditjen PKH, 2021) and West Nusa Tenggara has the largest shrimp production as many as 159.013 ton (18,03% of national production) in 2020 (KKP, 2022).

Table 1. Livestock population in Indonesia during 2014-2020

Livestock	Population (x 1.000 head)*						
	2014	2015	2016	2017	2018	2019	2020
Poultry Industry (x1000 head)*							
Broiler	1.443.349	1.528.329	1.632.801	2.922.636	3.137.707	3.169.805	2.919.516
Laying Hen	146.660	155.007	161.364	374.778	324.153	336.490	345.181
Native chicken	275.116	285.304	294.333	299.701	300.978	301.761	305.445
Duck	45.268	45.322	47.423	49.056	50.528	47.783	48.245
Manila Duck	7.414	7.975	8.170	8.502	9.024	9.446	8.325
Large Livestock Industry (x1000 head)*							
Beef cattle	14.727	15.420	15.997	16.429	16.433	16.930	17.440
Dairy cows	503	519	534	540	582	565	568
Buffalo	1.335	1.347	1.355	1.322	894	1.134	1.154
Horse	428	430	424	409	378	375	384
Fishery Industry (Ton)**							
Shrimp	630.655	607.152	692.568	919.988	911.856	863.118	881.599
Carp	118.776	113.406	132.333	234.083	173.345	183.354	No Data
Seagrass	10.076.991	11.269.341	11.050.301	10.547.552	10.320.202	9.775.985	9.618.420

Source : *Statistik Peternakan dan Kesehatan Hewan 2016-2021

**Statistik Kementerian Kelautan dan Perikanan (2022)

Now livestock industries has been looking for alternative products, such as probiotics, essential oils, plant extracts, acidifiers, enzymes, beta agonists, microflora enhancer and immuno-modulators, which may help to maintain livestock animal intestine health and improve production performance (Zhang *et al.* 2012; Mostafa *et al.*, 2014). Probiotics are defined as bio-preparations that include living cells, or metabolites of stabilized autochthonous microorganisms that optimize colonization and composition of gut microflora in both animals and

humans and have a stimulative effect on digestive processes and immunity of the macroorganism (Fuller, 1992; Bozkurt *et al.*, 2014). Probiotic microorganisms are going to modulate the balance and activities of gastrointestinal microbiota, whose role is basal to gut homeostasis (Kabir 2009; Chaucheyras-Durand and Durand, 2010). Probiotics provide to improve feed conversion for livestock farm, reduce morbidity or mortality, and benefit for consumer through improved product quality (Mohan *et al.*, 1995; Tortuero and Fernandez, 1995; Yesilbag and Colpan, 2006). Probiotic microorganisms could also inhibit the pathogenic *Escherichia coli* adhesion to intestinal mucosa (Coconnier *et al.*, 1993).

2. SCOPE OF EXPERIMENT

The scope of experiment is going to observe livestock performance which were be treated by Kotract KS50® Complex Microbe product.

3. RESEARCH AIMS

The Research aims are going to explore Kotract KS50® Complex Microbe product effect for livestock animal husbandry, including broiler and shrimp, through to

- 3.1 observe various parameters that improve a livestock performance;
- 3.2 observe animal health and;
- 3.3 observe a livestock product quality and quantity;
- 3.4 assess added value in livestock animal husbandry that using Kotract KS50® Complex Microbe.

4. METHODS

4.1 Time and Place

Team are going to prepare experiment location and experiment supplies in three weeks; execute animal farming in four weeks; execute laboratory examination in three months; analyze data in one month; and write final report. Shrimp will be conducted in commercial farm. Broiler farming will be conducted in IPB University animal facilities. The Laboratory examinations will be conducted in some IPB University laboratories. The total time that Team are going to finish the research is almost **six (6) months**. Activity plan matrix present in Table 9.

4.2 Experimental Design

4.2.1 Shrimp group

Three ponds will be selected from commercial shrimp farm and be treated with different treatments; treatment without probiotic, treatment with 1 ppm KS50® product, and treatment with 1 ppm other local commercial product of probiotic. The treatments are going to be given and the number of samples and specimens are going to be

collected for examination are presented in Table 5. Meanwhile, the explanation of these parameters is explained in the paragraph below.

4.2.1.1 Specific growth acceleration is parameter to inform increasing and percentage of growth level and body weight daily (Effendi, 1997; Wijayanto *et al*, 2020). Growth level will be measured from length of shrimp.

4.2.1.2 Body weight and feed consumption is most useful parameter in husbandry to inform feeding efficiency as known as Feed Consumption Rate (FCR). These examination will inform about the effect from each treatment, especially for treatment using probiotic, for feed digesting and absorbing or as known as feed conversion.

4.2.2 Beef cattle and dairy cow group

Nine cow of beef cattle and dairy cow in selected commercial farm will be divided into each three groups are presented in Table 2. All cows will be checked for early condition as pre-clinical examination. The treatments are going to be given to all groups and the number of samples and specimens are going to be collected for examination are presented in Table 5. The parameters will be examined on experimental animals are presented in Table 5. Meanwhile, the explanation of these parameters is explained in the paragraph below.

Table 2. Group of treatment for beef cattle and dairy cow groups

Treatment	Number of cow	
	Beef cattle group	Dairy cow group
Without probiotic	5	5
KS50® product (500 gr/cow)	5	5
Other local commercial product of probiotic	5	5

4.2.2.1 Feed weight will be measured to inform amount of feed intake from each cow. The result from each cow will be compared to know about increasing feed intake during examination, especially for treatment using probiotic.

4.2.2.2 Body weight and feed consumption is most useful parameter in husbandry to inform feeding efficiency as known as Feed Consumption Rate (FCR). These examination will inform about the effect from each treatment, especially for treatment using

probiotic, for feed digesting and absorbing or as known as feed conversion.

4.2.3 Broiler and laying hen group

One hundred DOC of Cobb CP 707 Strain are going to be purchased and used for the experiment. All DOC are going to be placed in one flock and divided into four groups each 25 DOCs are presented in Table 3. The treatments are going to be given to all groups and the number of samples and specimens are going to be collected for examination are presented in Table 6. The parameters will be examined on experimental animals are presented in Table 6. Meanwhile, the explanation of these parameters is explained in the paragraph below.

Table 3. Group of treatment for broiler groups

Treatment		Number of bird
Without probiotic		25
KS50® product	500 gr/kg feed	25
	100 gr/kg feed	25
other local commercial product of probiotic		25

One hundred laying hens are going to be purchased from specific farm will be placed in one flock and divided into four groups each 25 chickens. The treatments are going to be given to all groups and the number of samples and specimens are going to be collected for examination are presented in Table 6.

Table 4. Group of treatment for laying hen groups

Treatment		Number of bird
Without probiotic		25
KS50® product	500 gr/kg feed	25
	100 gr/kg feed	25
other local commercial product of probiotic		25

Egg examination will be checked to know every treatments effect to oviduct organs in producing egg. Egg physical will be checked for length, weight, and shell thickness, albumin quality (Haugh unit score), and yolk weight.

4.2.4 Water examination

Water examination will be checked to examine the effect from every treatments for condition in ponds. Water in pool will be contaminated by materials from feed waste, metabolisme excretion, detritus, metabolisme microorganisme, and residue of environment and disease control substance (Aatanti *et al*, 2014). These contaminations will be effect to condition of biochemical level condition, including

ammonia, DO (*Dissolved Oxygen*), BOD (*Biological Oxygen Demand*), COD (*Chemical Oxygen Demand*), alkalinity, and Nitrite. Beside that, there are standart of biochemical level condition for shrimp husbandry in Indonesia (KepMen LH, 2004; BSN, 2014).

4.2.5 Manure examination

Fresh manure from each beef cattle, dairy cow, broiler, and laying hen groups will be collected as many as 2 kg after the experiment and divide into some groups are present in Table 7. Half-part of fresh manure are going to be processed to be compost in dry place and anaerobic condition for 14 days. Sample of fresh manure and composting manure are going to collected and analyzed in laboratory against parameter of pH, humidity, ammonia, and C/N ratio. Samples are going to be collected as part of peak, inside, and base of manure or composting manure pile. Number of sample that are going to be collected from fresh manure and composting manure are presented in Table 7.

4.2.6 Socio-economy analysis

Benefit cost analysis will be applied for this experiment. The analysis will be conducted to assess the economic feasibility of using KS50® probiotic to livestock farm.

4.2.7 Data analysis

Data are going to analyzed using ANOVA technique.

5. EXPERIMENT BUDGET

The Experiment are going to required **IDR 439.472.000** or **\$ 30.375** and present in Table 10.

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7. TEAM RESEARCHER

The research are going to organized by

- 7.1 Dr. Eko S. Pribadi, Bach. of Vet. Med., M.Sc., DVM. (Leader)
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- 7.3 Deddy C. Sutarman, Bach. of Agri. Eng., MM. (Statistical Expert)
- 7.4 Sinta Sriutami, Bach. of Anim. Husb. (Administration and financial staff)
- 7.5 Ir. Asep Rakhmat M.Sc. (Agriculture Economic Expert)
- 7.6 Gusti A. Gultom, Bach. of Anim. Husb. (Administration and financial staff)

8. ATTACHMENT

Table 5. Number of specimens and sample are going to be collected from each group in shrimp groups and pond water

Parameter	Pre-clinical			3 rd Week			6 th Week			9 th Week			12 th Week		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
1. Specific growth acceleration															
1.1 Body lenght	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
1.2 Body weight	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
2. Feed consumption rate (FCR)	-	-	-	1	1	1	1	1	1	1	1	1	1	1	1
3. Water examination															
3.1 Ammonia	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
3.2 DO	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
3.3 BOD	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
3.4 COD	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
3.5 Alkalinity	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
3.6 Nitrite	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

Table 6. Number of specimens and sample are going to be collected from each group in beef cattle groups and dairy cow groups

Parameter	Pre-clinical			1 st Week			2 nd Week			3 rd Week			4 th Week		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
1. Feed nutrition examination	1			1			1			1			1		
2. Body weight	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
3. Feed consumption rate (FCR)	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
4. Amount of milk (for dairy cow groups)	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

Table 7. Number of specimen and sample are going to be collected from each group in broiler and laying hen groups

Parameter	Pre-clinical				1 st Week				2 nd Week				3 rd Week				4 th Week			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1. Body weight	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
2. Feed consumption rate (FCR)	-	-	-	-	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
3. Egg physical (for laying hen groups)	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10

Table 8. Number of sample to be collected from each group in manure experiment

Manure examination group		Fresh Manure	Composting Manure
Beef cattle groups	A1 = Manure without probiotic treatment	1 kg	1 kg
	A2 = Manure from KS50 [®] product treatment	1 kg	1 kg
	A3 = Manure from other local commercial product of probiotic treatment	1 kg	1 kg
Dairy cow groups	B1 = Manure without probiotic treatment	1 kg	1 kg
	B2 = Manure from KS50 [®] product treatment	1 kg	1 kg
	B3 = Manure from other local commercial product of probiotic treatment	1 kg	1 kg
Broiler groups	C1 = Manure without probiotic treatment	1 kg	1 kg
	C2 = Manure from KS50 [®] product treatment (500 gr/kg feed)	1 kg	1 kg
	C3 = Manure from KS50 [®] product treatment (100 gr/kg feed)	1 kg	1 kg
	C4 = Manure from other local commercial product of probiotic treatment	1 kg	1 kg
Laying hen groups	D1 = Manure without probiotic treatment	1 kg	1 kg
	D2 = Manure from KS50 [®] product treatment (500 gr/kg feed)	1 kg	1 kg
	D3 = Manure from KS50 [®] product treatment (100 gr/kg feed)	1 kg	1 kg
	D4 = Manure from other local commercial product of probiotic treatment	1 kg	1 kg

Table 9. Activity plan matrix

Activity Expenses	Month 1				Month 2				Month 3				Month 4				Month 5				Month 6			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1. Pre-experiment																								
1.1 Field technical staffs coordination	■																							
1.2 Regulation permission		■	■	■																				
1.3 Locations and supplies preparation	■	■	■	■	■	■																		
2. Experiment																								
2.1 Shrimp experiment																								
2.1.1 Pre-clinical trial							■																	
2.1.2 Clinical trial								■	■	■	■	■	■	■	■	■	■	■	■					
2.1.3 Data collection								■	■	■	■	■	■	■	■	■	■	■	■					
2.2 Beef cattle experiment																								
2.2.1 Pre-clinical trial								■																
2.2.2 Clinical trial									■	■	■	■												
2.2.3 Data collection									■	■	■	■												
2.3 Dairy cow experiment																								
2.3.1 Pre-clinical trial									■															
2.3.2 Clinical trial										■	■	■	■											
2.3.3 Data collection										■	■	■	■											
2.4 Broiler experiment																								
2.4.1 Pre-clinical trial									■															
2.4.2 Clinical trial										■	■	■	■											
2.4.3 Data collection										■	■	■	■											
2.5 Laying hen experiment																								
2.5.1 Pre-clinical trial										■														
2.5.2 Clinical trial											■	■	■	■										
2.5.3 Data collection											■	■	■	■										
2.6 Water examination										■				■			■			■				

Activity Expenses	Month 1				Month 2				Month 3				Month 4				Month 5				Month 6			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
2.7 Manure examination																								
2.8 Socio-economy survey																								
3. Post-Experiment																								
3.1 Data analysis																								
3.2 Reporting research																								

Table 10. Financial Budget