The organoleptic and chemical characteristic of black potato tubers mixed *Lactobacillus plantarum* as a synbiotics for duck

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Abstract

The aim of the study was to evaluated organoleptic and chemical Characteristic of black potato tubers mixed *Lactobacillus plantarum* as a Synbiotics for duck. The completely randomized design with 3 treaments and 6 replications were used in the research. The treatments were T0 = black potato tubers + 0 % *Lactobacillus plantarum*, T1 = + 5 black potato tubers % *Lactobacillus plantarum*, T2 = black potato tubers + 10 % *Lactobacillus plantarum*. The parameters were organoleptic properties (color, smell and texture) and chemical properties of black potato tubers mixed *Lactobacillus plantarum* as a Synbiotics. The Result showed that there are no significant the organoleptic and chemical properties of black potato tubers mixed *Lactobacillus plantarum* as a Synbiotics.. The conclusion was the The conclusion was there are no change the organoleptic and chemical characteristic of black potato tubers with added *Lactobacillus* Sp as a synbiotic for duck.

Keywords: *Maranta arundinacea L*, *Lactobacillus plantarum*, symbiotic

Introduction

Ducks are one of the local waterfowl that are widely developed in Indonesia because of their high adaptability to the environment. The productivity of ducks is not only determined by an increase in body weight and feed efficiency but also their resistance to disease. The productivity of ducks is greatly influenced by the feed. Synbiotic is combination of prebiotics and probiotics that can be used as feed additives and work synergistically so that it benefits the host [1]. The use of prebiotics combined with probiotics to become synbiotics serves to stimulate and increase the population of lactic acid bacteria and suppressing the growth of pathogenic bacteria [2]. Lactobacillus plantarum is a type of homofermentative probiotic lactic acid bacteria that produces lactic. Prebiotics is One of the factors that support the optimization of the work of probiotics.

Prebiotics are defined as carbohydrates that are not digested by the host but are fermented selectively by several intestinal microflora [3]. The high content of oligosaccharides and polysaccharides is found in black potato tubers (Coleus tuberosus). Black potato tubers contain high enough oligosaccharides and polysaccharides in the form of starch, maltose and

maltotriose compounds [4]. Utilization of oligosaccharides can support the growth of intestinal bacteria including Bifidobacterium, Lactobacillus plantarum, Lactobacillus reuteri, Lactobacillus rhamnosus and can inhibit the growth of E. Coli and Clostridia which in turn supports livestock health [5]. The aim of the study was to evaluated organoleptic and chemical Characteristic of black potato tubers mixed *Lactobacillus plantarum* as a Synbiotics for duck.

Materials and Methods

Materials

Research was done on Laboratory Feed Technology, Faculty of Animal and Agricultural Sciences, Diponegoro University. Materials research were Black potato tubers and *Lactobacillus plantarum* isolate from Laboratory Feed Technology collection.

The symbiotic production method

The symbiotic production method is through the prebiotic production of black potato tubers through several stages. The black potato tubers were washed, cleaned, drained and dried until the moisture content was 12% then ground into flour. The symbiotic production was done by mixing the Black potato tubers with *Lactobacillus plantarum* probiotic according to the treatment. This symbiotic product was incubated anaerobically for 4 x 24 hours at 37 ºC.

Statistical Analysis

The completely randomized design with 3 treaments and 6 replications was used in the research. The treatments were T0 = Black potato tubers + 0 % *Lactobacillus plantarum*, T1 = Black potato tubers + 2% *Lactobacillus plantarum*, T2 = Black potato tubers + 4 % *Lactobacillus plantarum*. The parameters were organoleptic physical qualities (color, smell and texture) and chemical qualities of Black potato tubers mixed *Lactobacillus plantarum* as a Synbiotics. The organoleptic physical qualities using a panel of experts as many as 25 people. The Organoleptic quality assessment standards can be seen in Table 1. The chemical Quality were analysed for moisture, ash, protein and lipid contents according to methods described in American Association of Cereal Chemists [6]. The data was analyzed by analisys of varians and Duncan Multiple Range Test [7].

Table 1. The organoleptic quality assessment standards of Black Totato tubers mixed *Lactobacillus plantarum* as a synbiotics

Scale	Color	Smell	Texture
1	Black	Stink	Very rough
2	Brown	Sour	Rough
3	Brownish yellow	Potato	Rather rough
4	Yellow	Odorless	Fine

Results and Discussion

The parameters were organoleptic physical qualities (color, smell and texture) and chemical qualities of Black potato tubers mixed *Lactobacillus plantarum* as a Synbiotics showed in Tabel 2 and Tabel 3.

Table 2. The organoleptic physical qualities of Black Potato Tubers mixed *Lactobacillus plantarum* as a synbiotics

Treatments	Color	Smell	Texture
Black potato tubers + 0% *Lactobacillus plantarum*	3.28±0.01	4.11±0.01	4.18±0.02
Black potato tubers + 2% *Lactobacillus plantarum*	3.11±0.01	4.08±0.01	4.17±0.02
Black potato tubers + 4% *Lactobacillus plantarum*	3.12±0.01	4.09±0.01	4.16±0.02

Table 2. showed that there are no significant the organoleptic physical quality of black potato tubers mixed *Lactobacillus plantarum* as a Synbiotics. The scale of organoleptic quality were 3,11 – 4,18. The Organoleptic Quality of synbiotics product for duck have brownish yellow color, potato smell and fine texture. The characteristic product are dependent of botanical source and determine the quality of product [8].

Table 3. The chemical qualities of Black potato tubers mixed *Lactobacillus plantarum* as a synbiotics

Treatments	Crude Protein	Crude Fat	Amylose	Resistant Stach
	---------- % ----------			
Black potato tubers + 0% *Lactobacillus plantarum*	4.2 ±0.01	0.2±0.01	13.4±0.02	1.3±0.01
Black potato tubers + 2% *Lactobacillus plantarum*	4.3±0.01	0.2±0.02	13.5±0.02	1.4±0.01
Black potato tubers + 4% *Lactobacillus plantarum*	4.3±0.02	0.2±0.02	13.4±0.02	1.4±0.01

Table 3 showed that showed that there are no significant the chemichal properties of Black potato tubers mixed *Lactobacillus plantarum* as a Synbiotics. The Synbiotic product contain resistant starch 1,4 %. Some studies have demonstrated resistant starch fermentability characteristics with an induction of *Bifidobacteria* and *Lactobacilli* populations [9]. This result is different from the results [10] that fermentation in symbiotic processing may thus change the chemical components and thereby modify both physical properties.

Conclusion

The conclusion was there are no change the organoleptic and chemical characteristic of black potato tubers with added *Lactobacillus* Sp as a synbiotic for duck.

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