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Herbal for increasing immunity and weight of poultry

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Abstract. The use of natural materials as a drug tends to increase with the issue back to nature and the prolonged crisis caused a decline in the purchasing power of modern medicines are relatively more expensive. Natural medicine is also considered almost no harmful side effects. The research question to be answered in the third year of research: (1) What medicinal benefits to the immune system and increase the weight of poultry (2) The form of herbal preparations which one is more effective administration, such that to bjective of this study is to: (1) Improve endurance and body weight of poultry (2) Getting the dosage of herbal medicine more effective administration. This study will be conducted in the town of Pare-pare for 10 months in the third year (April to December 2018). Research compiled by factorial design was completely randomized design (CRD), as many as 50 chickens aged 14 days were divided into 3 treatment. Parameters measured were an increase in endurance and chicken body weight, while the level of drug dosage forms (herbal medicine) herbal so consist sof three levels, namely Extractum (control), pulvis, and kapsulae. The results of the study state that livestock can be an alternative herbal medicine as a drug because it can increase the resistance of chickens so that the mortality rate decreases. Of the three doses given, capsule dosing is more effective.

1. Introduction

Since the first humans rely heavily on the surrounding environment to meet the needs, such as for food, shelter, clothing, medicines, fertilizers, perfumes, and even for beauty. However, the natural resources have not been fully explored, exploited, or even fully developed. Potential plants and medicinal herbs in the health field is still very wide open for development. In the spices and herbs are contained compounds bioactive function as an antimicrobial [1], antioxidants [2], antidiabetic [3], anticancer [4], and other functions that are beneficial to maintaining health and is not believed to have



any harmful side effects [5]. Traditional medicine from natural herbs have been used for generations by our ancestors to maintain stamina and treat several diseases. The traditional herb commonly known as herbal medicine [6]. Nowadays herbs used not only for humans, but herbal medicine has begun to be known among poultry farmers. They used of some medicinal plants as traditional medicine for their animals instead of manufactured drugs that are considered expensive, especially for medium-scale farmers to bottom [7].

Research on the use of herbal medicine in various animal tests have been done by [7,8], the free-range chickens [9] in poultry broiler [10] the duck [11] in cattle quail [12] on rabbits, but all researchers using herbs or herbal remedies in the form of a solution (solution) were mixed in drinking water livestock. One disadvantage of herbal medicines in the form of a solution (solution) is to be voluminous, making it less pleasant to be carried or transported and stored, heavier and, an ideal medium to breed microorganisms that required the addition of preservatives more dosage than tablets, pills, creams, so it needed a technology to get another dosage form more beneficial.

The preparation of herbal medicine (herbal medicine) that can be done is to make herbal medicine (herbal medicine) in dosage forms pulvis (powder) and kapsulae by using gum arabic. However, quantitative data quality herbal drug dosage change (herbs) of cattle of the preparation ekstraktum to pulvis (powder) and kapsulae, packaging forms, the old store, and a dose of herbal medicine in various poultry unknown. So it takes a study to determine the effect on the quality of gum arabic, old store, and drug packaging form herbs (herbs) and a dose of herbal medicine in the preparation of pulvis (powder) and kapsulae appropriate for a variety of poultry.

Based on these descriptions, there are three research questions to be answered in the study : (1) what is the concentration of gum arabic provide the best quality at any dosage form of herbal medicine for livestock, (2) what is the long shelf life of each form preparation of herbal medicine with different packaging, and (3) What are the benefits of each dosage form of herbal medicine for animal health poultry.

2. Literature review

The utilization of medicinal plants as old as human civilization. Plants are chemical warehouse that has a million of benefits including to cure various diseases. Ability dispensing medicinal plants and herbs is a legacy hereditary and deeply entrenched in society. Plants that are the raw materials of traditional medicine are spread almost all over Indonesia. In Indonesia's tropical forests there are 30,000 species of plants. Of these about 9,600 known species of medicinal, but only 200 species have been used as raw material for traditional medicine [13]. The opportunity to develop the cultivation of medicinal plants are still very open in line with the development of industrial herbs, medicinal herbs, fitofarmaka and traditional cosmetics. Plant medicine is defined as the type of plant part, or the whole plant and plant exudates are used as medicine, materials, or herbs. Other experts classify medicinal plants into three groups [14], namely :

- Traditional medicinal plants is a plant species that are known or believed to have medicinal properties and communities have been used as traditional medicine
- Modern medicinal plants are plant species that have been scientifically proven to contain bioactive compounds or medicinal ingredient and its use can be justified medically.
- Potential of medicinal plants is a plant species that is thought to contain or have bioactive compounds or medicinal substance but not yet proven scientifically-medical use as medicine.

In line with the industrial development of herbal medicine, traditional cosmetics fitofarmaka and also encourage the development of cultivation of medicinal plants in Indonesia. So far, efforts to provide the raw material for traditional medicine industry mostly derived from plants that grow in the wild or cultivated on a small scale in the neighborhood around the house with the quantity and inadequate quality. It needs to be developed aspects of cultivation according to the standard traditional medicinal raw materials.

The use of natural materials as a drug tends to increase with the issue of *back to nature* and the prolonged crisis caused a decline in the purchasing power of modern medicines are relatively more

expensive. Natural medicine is also considered almost no harmful side effects. That argument is not necessarily true because to know the benefits and side effects of these drugs are certainly necessary research and preclinical testing and clinical trials [15]. Indonesia natural medicine can be grouped into three *Herb* which is a traditional herb that has not been clinically tested, herbal remedies are natural medicines that have passed the stage of preclinical testing, while fitofarmaka are natural medicines that have passed the preclinical and clinical trials (Decree Head of BPOM No. HK.00.05.4.2411 May 17 2004)[16]. Dissemination of information regarding research and testing has been done on natural medicines should be a concern for all parties because it involves the safety of the drug use. Some things to know before using natural medicines are the strengths and weaknesses of traditional medicine and medicinal plants [17]. The advantages of natural medicine, among others: The side effects of traditional medicine is relatively smaller when used correctly and appropriately, both the right dose, time of use, method of use, accuracy of selection of materials, and the accuracy of the selection of traditional medicines or herbs of medicinal plants for specific indications.

The existence of complementary effects or synergism in the ingredients/components bioactive medicinal plants. In a traditional medicinal herbs are generally composed of several types of medicinal plants that have the effect of supporting each other to achieve the effectiveness of treatment. Formulation and composition of these ingredients are made as accurately as possible so as not to effect a contradiction, even have selected the type of herb and mutual support against a desired effect. At one plant can have more than one pharmacological effects. The active substances in medicinal plants are generally in the form of secondary metabolites, while one plant can produce several secondary metabolites, allowing these plants have more than one pharmacological effects.

Traditional medicine is more appropriate for metabolic diseases and degenerative. The change in consumption patterns lead to impaired metabolism and physiology in line with the process of degeneration. Which includes metabolic diseases including diabetes (diabetes), hyperlipidemia (high cholesterol), gout, kidney stones, and hepatitis. While including degenerative diseases including rheumatoid arthritis (arthritis), asthma (shortness of breath), ulcers (peptic ulcers), haemorrhoid (ambein / haemorrhoids) and senile (lost of memory). To treat these diseases take a long time so that the use of natural medicine is more appropriate because the side effects are relatively smaller.

In addition to the advantages, natural medicine also has some disadvantages which are also an obstacle in the development of traditional medicine, among others: the effects of pharmacological weak, the raw material has not been standardized and is hygroscopic and voluminous, has not performed clinical trials and easily contaminated with various microorganisms [15]. Efforts traditional drug development can be done in various ways with particular approaches, so found the dosage form of traditional medicine which has proven efficacy and safety, be justified by scientific bias and meet the medical indications, namely the Fitoterapi drugs or fitofarmaka. To get fitofarmaka product must go through several stages (test pharmacology, toxicity and clinical trials) to be able to answer and overcome these weaknesses.

2.1 Herbal medicine for animals

Along with the progress in the field of animal husbandry, demanded that all production costs must be optimized in order to produce an output (output) is expected. The high production costs, especially drugs, requires farmers to seek other alternative solutions to overcome it. In addition to increasing public awareness of the importance of food safety (food safety) are consumed. Since the financial crisis that occurred in Indonesia until the current price of drugs manufactured (imported) is very expensive, so it is not affordable by livestock farmers, especially farmers in scale to the middle [18].

Herbal of some plants such drugs can be made by livestock farmers and the price is cheaper than drugs factory, but the efficacy is quite good for the prevention or treatment in poultry, among other diseases of respiratory disorders (Snot and CRD), coccidiosis, lack of appetite, diarrhea, green feces, increase sexual libido [19]. That some type of plants are able to act as probiotics for humans and livestock. Some plants have properties of traditional medicines and herbs, among others lempuyang, ginger, turmeric, kencur, aloe vera, curcuma, garlic, leaf beluntas, bitter leaf and others.

Herbal medicine animal and plant medicinal drugs as a "feed additive" has been done by poultry (local chicken, chicken broiler, layer, quail, ducks and pet birds) in the area of Jakarta, West Java, East Java, South Kalimantan, East Kalimantan, Riau). Livestock localchicken (village) broilers and laying hens are kept in the herd, daily treated with a solution of herbs animals through drinking water turned out to give a positive response to the growth and stamina of chicken for the better (a rare illness and low mortality), carcass fat is very low, aroma meat and eggs is not fishy, yolk color is orange / scores above 7, and the smell of chicken manure (ammonia) around the cage is reduced. Race broiler chickens, laying and local poultry (chickens and ducks) were given a concoction of medicinal plants as a "feed additive" shows an increase in the efficiency of feed and animal health. Giving concentrate, herbs and UMMB cattle, can accelerate the increase in body weight daily (PBBH) in cattle from 0.32 to 0.52 kg / head / day (62.50%) in the parent Bali cattle, whereas the superior cow can Simental PBBH increase from 0.88 to 1.14 kg / head / day (29.54%) [18].

2.2 *Form drug stocks herbal.*

Traditional medicine is an ingredient or ingredients in the form of plant material, animal material, mineral materials, preparation or galenic sarian, or mixtures of these materials, which are falling down has been used for treatment based on experience. Traditional medicine is a product made from natural ingredients that type and nature of its content is very diverse so as to ensure the quality of traditional medicines required good manufacturing practice [20]. In these days in the midst of the many types of modern medicine on the market and the emergence of new types of modern medicine, there is a global tendency to return to nature (back to nature). Factors that encourage people to utilize natural medicine include the high price of modern medicine / synthetic and a number of side effects [21].

Fitofarmaka preparations are still not very popular among the people, rather than herbs and herbal standardization. However, the preparation is basically similar to the preparation fitofarmaka herbs because it also comes from natural ingredients. In medicine, fitofarmaka can be interpreted as the preparation of herbal remedies that have been touched by modern science and technology. Thus the efficacy and use of fitofarmaka more credible and effective than the usual dosage of herbal remedies, because it has a clear scientific basis [22]. Although both formulated from natural ingredients, but Fitofarmaka far surpasses ordinary herbal preparations, even this preparation also can be compared with modern medicine. This is due to fitofarmaka has gone through some process that is equivalent to modern medicine, including Fitofarmaka have passed the quality standards, both in the process of manufacture to packaging of the product, so it can be used in accordance with the effective and appropriate dose (Evisal).

2.3 *Technology gum arabic.*

Gum arabic is produced from the sap of various trees *Acacia* sp in Sudan and Senegal. Gum arabic is basically a series of units of D-galactose, L-arabinose, D-galacturonic acid and L-rhamnose. The molecular weight of 250000-1000000. Gum arabic is much more soluble in water than other hydrocolloid. In the processed food that contains a lot of sugar, gum arabic is used to encourage the formation of fat emulsion steady and prevent sugar crystallization. Gum is purified through the deposition process with the use of ethanol and followed the process of electrodialysis, gum arabic stable in acidic solutions. the natural pH of the *Acacia* Senegal gum is in the range 3.9 to 4.9 which is derived from glucuronic acid residues [23].

Gum arabic can increase stability with increased viscosity. Thickener type is also heat resistant to the process that uses heat but it's better if the heat is controlled to shorten the heating time, given gum arabic can degraded slowly and lacked efficiency of emulsification and viscosity [24]. According Alinkolis [19], gum arabic can be used for fastening flavor, thickeners, film-forming and stabilizing the emulsion. Gum arabic will form a solution that is not very thick and does not form a gel at the concentrations used (highest 50%). Viscosity increases in proportion to the increase in concentration. Gum arabic has a group of arabinogalactan protein (AGP) and glycoprotein (GP), which acts as an emulsifier and thickener [23]. Gum arabic is an effective emulsion thickening agent because of its

ability to protect the colloid and is often used in making bread[24]. Gum arabic has unique due to its high solubility and low viscosity. Chemical characteristics of gum arabic based on a dry basis in the form of galactose percentage is 36.2 ± 2.3 ; Arabinose 30.5 ± 3.5 ; Rhamnosa 13.0 ± 1.1 ; Glukoronik acid 19.5 ± 0.2 ; Protein 2.24 ± 0.15 [23].

3. Method

3.1 Research design

Research compiled by factorial design was completely randomized design (CRD), as many as 50 chickens aged 14 days were divided into 3 treatment. Parameters measured were an increase in endurance and chicken body weight, while the level of drug dosage forms (herbal medicine) herb also consists of three levels, namely Extractum (control), pulvis, and kapsulae.

3.2 Location and time research

This study will be conducted in the town of Pare-pare for 10 months, the first year of studies have been conducted to obtain information about the quality of various dosage forms of medicinal herbs livestock and sophomores are looking for packaging that can deliver power savings and long on a variety of dosage forms herbs herbak cattle, while for the year third (April-December 2018) will be implemented the benefits of herbal medicine for livestock on poultry.

3.3 Population and Sample

The population in this study is that chicken Poultry aged 14 days were in the town of Pare-pare. *The tools used include; grated, metal sieve, a frying pan large size, pans, gas stove, mortar pestle, scales, 10 ml measuring cup, scissors, and a camera.* While the materials used in the study include; white turmeric (curcumin), red ginger (zingeron), galangal (methyl-cinnamic), garlic (allicin), gum arabic, distilled water, filter paper, fuel gas, label samples, container almonium foil, containers of plastic bottles, containers bottles glass and printer ink.

3.4 Data processing and analysis techniques

Data processing is done by recording the number of results of tests conducted on the sample. data processing is done with several stages, namely editing and tabulating. The data obtained is in the form of qualitative, namely the dosage tested in poultry animals, while the quality of the material is proven through literature

3.5 Results and discussion

This study uses a completely randomized design (CRD) with 4 treatments. Treatment of the study are as follows, and data were statistically analyzed using ANOVA. If the analysis of variance showed a marked influence then analyzed the data continued using Duncan test:

R0 = control ration

R1 = Herbal liquid extract

R2 = Herbal Powder

R3 = Capsules

3.6 Parameters measured.

Body weight gain (g / bird), body weight of chicks is weighed and recorded every week. Weekly chicken weight gain is calculated by way of a reduction in body weight of chicks at the end of the week reduced body weight in early week chicks.

4. Result and discussion

4.1. Body weight gain

Body weight gain during treatment can be seen in the table 1. This parameter indicate the growth rate of the chicken. During treatment, body weight gain ranged from 645.35 to 690.53 g. R3 shows the highest weight gain (690.53 g), followed by 657.20 (R2) and the lowest value of body weight gain is R1 (645.23 g). The growth rate of the chicken supplemented with herbal were higher than untreated chicken. The analysis of variance showed that treatment significantly affect weight gain. This proves that the herbal supplementation on chicken can increase body weight gain. An increase in digestibility and durability in the treated chicken resulted better intake of nutrients so that resulting the higher chicken body weight gain.

Table 1 The effect of herbal supplementation on Body Weight Gain of the Chicken

Treatment	Added mm (g/head)
R0	602.50
R1	645.23
R2	657.20
R3	690.53

4.2. Mortality

The number of chickens that died during the study called mortality. The effect herbal supplementation on chicken mortality during research can be seen in table 2.

Table 2 Chicken mortality

Treatment	Mortality (%)
R0	2.40
R1	0
R2	0
R3	0

The percentage of mortality on treatment ranged from 0 to 2.40%. Herein is seen that chicken receiving herbal treatment shows liveability better when compared with the untreated control chickens. This could be due to the active substance content of medicinal plant materials used.

5. Conclusion

Medicinal Herbal can be an alternative herbal drug because it can increase the liveability of the chicken as shown by mortality percentage. Of the three dosage given, the most effective administration of medicinal herbal for poultry is by capsule form.

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