CHAPTER 1 INTRODUCTION

1.1 Background of Research

Coccidiosis is one of the major problems in poultry husbandry with significant economic impact on broiler chicken production (Haug *et al*., 2008). It is a disease of almost universal importance in poultry production. The disease may strike any type of poultry in any type of facility. The parasite multiplies in the intestinal tract and causes tissue damage, resulting in diminished feed intake and nutrient absorption, reduced bodyweight gain, dehydration, blood loss, and increased susceptibility to other diseases (Elmusharaf, 2007).

In-feed medication for prevention and treatment contributes a major portion of these losses in addition to mortality, mal-absorption, inefficient feed utilization and impaired growth rate in broilers, and a temporary reduction of egg production in layers. *Eimeria* sp. possess a complex life cycle comprising of both sexual and asexual stages, and their pathogenicity varies in birds of different genetic backgrounds (Lillehoj and Chai, 1988).

Since vaccination requires the generation of immunological memory against subsequent challenge infection it is appropriate to consider the mechanisms by which the host kills the *Eimeria* parasite. It is now becoming apparent that the host response that are most critically important in terms of protective immunity may differ between *Eimeria* sp. and reflect subtle variations in the overall host – parasite relationship (Sherley, 2005).

Conventional disease control strategies rely heavily on chemoprophylaxis and to a certain extent, on live vaccines. However, drug-resistance in coccidial populations has been a constant threat to the continued success of prophylactic chemotherapy. Moreover, the increasing regulations and bans on the use of anticoccidial drugs coupled with the high costs of developing new drugs enhance the need for development of novel approaches and alternative control strategies for coccidiosis (Williams, 2006).

The development of drug resistance represents a recurring problem that has led to the increased interest in the search for anti-coccidial vaccines to control the disease. Live virulent strains comprise a variable number of wild type strains depending on their formulation and field application (Lee, 1987). There are at least four types of live anticoccidial vaccines currently available for use in chickens, two of them are virulent and two are attenuated (Bedrnik *et al*, 1995).

On the field case, anti-coccidial drugs, to a lesser extent, live and attenuated parasite vaccines, are the primary methods of disease control. However, use of anti-coccidials has led to drug resistance not be effective against antigenic field variants. Recombinant coccidial vaccines offer an alternative approach, but are limited in their ability to confer cross-immunity to the 7 different *Eimeria* species that infect chickens (Lillehoj *et al*, 2005).

Alternative of vaccine intake in other side of food anti-coccidiostat can have a lot of benefit to farm. Sporozoites as induce of oocyst that able to digest in young chicks because have delight stive tract wall before coccidiosis attact. The farm coccidiosis prevention need a big invention of new vaccine which effective enough to

repel the effect of its disease. In the other hands, it also contains best IgG materials which have important rule to solve coccidiosis problem. Also, it have low-cost production which can give benefit to farm. It is important to do a research to know the effect of Sporozoites giving in the different time and different dose of administration.

Since vaccination requires the generation of immunological memory against subsequent challenge infection it is appropriate to consider the mechanisms by which the host kills the *Eimeria* parasite. Beside to the use of anti-coccidial drugs is the development of the strategies aimed inducing protective immunity against the parasite. The research which was giving of sporozoites as a live vaccine unit had not been reported in veterinary medicine. It is necessary and important to do a research from the effect of sporozoites giving in the form of antibody IgG pattern through ELISA.

Based on the background above, the objective of the research is to know the antibodies level of each different dose of sporozoit infection in $2x10^4$, $4x10^4$, $8x10^4$ before and after booster vaccination which is examined with Enzym Linked Immuno Assay (ELISA). This research is expected to know the highest level of antibodies IgG from first and second booster vaccinated chicken from through the Enzym Linked Immuno Assay (ELISA). It also can get the result of candidate vaccine with the best capability to repel coccidiosis with the lower risk to solve the coccidiosis problem and become the alternative of cooccidiosis with best effectiveness than anti-coccidiostat agent in feed.

1.2 Statement of Problems

1. How is the antibody level IgG in the first and second administration in the different dose $2x10^4$, $4x10^4$, $8x10^4$ through ELISA?
2. Is there the highest antibody IgG level in the first and second administration in the different dose $2x10^4$, $4x10^4$, $8x10^4$ through ELISA?

1.3 Theoretical Base

According to (Lillehoj and Chai, 1988), in-feed medication for prevention and treatment contributes a major portion of these losses in addition to mortality, mal-absorption, inefficient feed utilization and impaired growth rate in broilers, and a temporary reduction of egg production in layers. *Eimeria* sp. possed a complex life cycle comprising of both sexual and asexual stages, and their pathogenicity varies in birds of different genetic backgrounds.

Infection of *Emeria tenella* with 1×10^4 to 1×10^5 oocyst/chicken caused the pathologic effects in chickens. The infection with doses 1×10^3 to 1×10^5 oocyst/chicken show increase number in oocyst production (Hasan, 2009). In coccidiosis infection, the chickens react in several ways. Following the ingestion of *Eimeria* oocysts, the non-specific portion of the immune system is antagonistic in the form of low pH, enzymes, and inflammatory reactions. This will limit the number of viable sporozoites that reach the site of infection. When the infection is established, the specific immunity system will become active in the form of specific antibodies and specific cellular immunity (Jeurissen and Veldman, 2002).

The best type of vaccines that can be used to against coccidiosis is active vaccines, that can induce immunity in the form of a live vaccine (Yunus, 2001). The

characteristics of live vaccines should be easy to get, inexpensive, and stable in extreme weather and non pathogenic. In addition, the effect of the active vaccines must be durable (Baratawidjaya, 2006).

1.4 The Aims of Research

1. To informed the pattern of antibody level IgG in the first and second infection in the different dose $2x10^4$, $4x10^4$, $8x10^4$ through ELISA.
2. To know the highest of antibody level IgG from ELISA test from antibody level IgG in the first and second administration in the different dose $2x10^4$, $4x10^4$, $8x10^4$.

1.5 The Outcomes of the Research

1. The research can be used as information about the advance of vaccination in broiler for *Eimeria tenella* infection.
2. The research can be used as the featuring to increase the production of poultry farm in Indonesia, particularly in terms of providing meat by prevent the disease coccidiosis in broiler chickens.

1.6 Hypothesis

1. Antibody IgG in chicken increase in the first and second administration in the different dose $2x10^4$, $4x10^4$, $8x10^4$ through ELISA.
2. There is the highest antibody IgG in the first and second administration in the different dose $2x10^4$, $4x10^4$, $8x10^4$ through ELISA.