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THE EQUINE COLOSTRUMS OF MILK TREATMENTAGAINST PATHOGENIC AGENT

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Abstract
Neonate losses are very important case in young animals in Indonesia, which is due to the virus, bacteria or parasites in conjunction with failure of passive transfer (FPT). Consequently, it is very urgent to break down these problems by realizing a scientific strategy on immunoglobulin-G (IgG) passive transfer in neonates. The existence of neonates life naturally depends on environmental conditions included to the nutrients supplied by their mother. The proteins immunoglobulin contained in the mother's colostrums are essential nutrients for immunity system of the newborn. This article aims to present the use of protein immunoglobular in colostrums through passive transfer of antibodies as a strategy in response to the high mortality rate of neonate animals in Indonesia, especially to goat farm in traditional farm maintenance system. In a farm system like this, it has a high risk of pathogenic infection. Limitations on the immune system of a new born occurred because in the uterus, a variety of antibody molecules from mother circulation cannot be transferred through the placenta to embryo. Consequently in the new ex-utero environment, such individuals are very susceptible to various infections of pathogenic micro-organisms.

Keywords: *IgG; colostrum; goat, neonate; pathogenic agent.*

INTRODUCTION

Food and nutrition for livestock neonates are very important to get attention, because it will determine its ability to defend itself against pathogenic environment and to the needs of his physical development. In the early stages of postpartum, nutrients for neonates are naturally derived from colostrum. However, the failure to obtain colostrum from its mother could happen due to various causes, such as newborn individuals in a weakened condition, less colostrum production, or improper handling during the birth process. These conditions result in a high mortality rate in individuals' neonatal period. Failure to maintain life in the newborn organism is generally caused by anoxie (hypoxy), hypothermic, and distocie (Grongnet, 1996). This situation of FPT (failure of passive transfer) relating to microbial infection pathogens from ex-utero environment. Therefore it is often associated with conditions where antibodies cannot be transferred from the parent to her newborn. Failure of Passive Transfer is generally associated with a lack of antibodies in the body of the neonate.

The Condition of Traditional Livestock

Decline in population and productivity of the Indonesian buffalo is generally caused by the pattern of traditional maintenance, reduced grazing land, males productive slaughter that reduced quantity of males, productive female buffaloes slaughter, the limitations of feed (dry season), high young buffalos mortality and decreased productivity (Phaharani et al., 2010). The ruminant livestock in Indonesia, which are traditionally carried out by the society, is generally in small-scale category and often face various problems in its development. Consequently, all parties need to contribute more serious attention in this farm to facilitate and to increase farm production, which will be able to improve the welfare of the society. One aspect to note in this condition is to handle the case of f*ailure of passive transfer* after the parturition moment. Birth process must be passed successfully before continuing on the protection of neonate's health naturally against microbial pathogens. The ability for defense on pathogenic agents has to be done through a variety of mechanisms. In this period, neonates are confronted with various challenges such as nutritional dependence on the dam and the condition of immunity against the pathogenic microbe's threats outside the womb (Thibault and Levasseur, 1991). Transfer of acquired immunity from the mother through the placenta, needed for the growth and development of neonate's organisms. New individual must immediately adapt to the conditions of a new biological environment to maintain its presence in the environment which has a potential infection such as bacteria, viruses and parasites. Neonatal mortality in the first few weeks remains high, where cattle livestock nearly 10% and half of this occurs in approximately 24 hours after birth (Liu et al., 2011), especially in the traditionally maintained farms.

Failure of Passive Transfer (FPT)

When the new born animals have a gammaglobulinemia, they will have a high risk in passive transfer of immunoglobulin as a failure of passive transfer (FPT), and therefore, these animals have difficulty to adapt in their ex-uthero environment (Crisman and Scarrat, 2008). Physical factors fairly extreme in the environments can also deliver new individuals born in critical situations, for example when the surrounding temperature is extreme than the newborn animals cannot tolerate and therefore disrupt the regulatory functions that would impact the immune system in the face of infectious microorganisms pathogens. This situation can affect mortality in new born animals (Rumokoy et al., 2011).

Immunoglobulin Passive Transfer as an Alternative Solution

Buffalos have epitheliochorial placenta type. The epitheliochorial placenta of ruminants does not allow passage of immunoglobulins from dam to foetus. Consequently, ruminant neonates are born in a state of hipoglobulinemia, or even in a state of agamaglobulinemia. For this reason, we need a way to overcome this condition. A good way is to treat with a passive antibody transfer. Passive transfer studies in new born showed there was no difference in IgG serum concentration of the goat after supplementing until 10 g IgG per liter colostrum of horses. In other hand, there is any mortality among experiment animal (Rumokoy et al., 2011). Antibodies in colostrums can prevent infectious diseases by providing passive immune protection (Zeitlin et al., 2000).

Several techniques can be applied to passive transfer of immunoglobulin, when faced with FPT problems, by supplying IgG, either in form of lyophilisate, or in the fresh form.

The immunoglobulin-G passive transfer can be used to treat the immunodeficient of mice against infection of lethal ebola virus infection (Gupta et al., 2001). This antibody can be applied also for preventing disease after exposure to a biological agent which is partially a function of the immunity of the exposed individual (Casadevall, 2002). The passive immunoprotection targeting secreted factor *propionibacterium acnes* as a novel immunotherapeutic (Liu et al., 2011). When applying IgG in colostrums from another parent, the individual recipient will also receive nutrients origin from colostrums of donor. Nutrients of protein mainly dominated in colostrum elements, including the immunoglobulin itself.

Colostrum Milk of Horse for Pathogenic Control in Goat

The equine colostrum contains IgG abundantly, and therefore, it is very important to be used as natural substance for pathogenic control in animal, which it has been tested to the young goats (Rumokoy et al., 2011). The use of equine colostrum for this purpose can be considered for the treatment of failure of passive transfer.

MATERIALS AND METHOD

Animal experiments: Horses local parent, which was used in the first year and the second to assess the potential for the synthesis of biomolecules imunoglobuin-G globular protein with extensive maintenance techniques from Tomohon area. Goat newborn (neonate) during perinatus assesses the acquisition of passive transfer of IgG antibodies against mortality. The cattle used in the period perinatus, i.e. from prepartum to postpartum stages, reared extensively Sea of goat farming village, Minahasa regency. The IgG analysis tools derived from ID-Biotech (HIgG1 092 811)

This experiment was using a completely randomized design factorial arranged. A factor is the level of immunoglobuline - G (A1 = 0 gL^{-1}, A2 = 5gL^{-1}A3 = 10gL^{-1}), and Factor B is an interval h0, h1, h2, and h3. Parent goats gestation period end was chosen to get a local kid, and been born a normal kid. Parent goats have been maintained extensively grounded in surveillance and equal treatment. Goat kids were divided into two groups: those receiving colostrum IgG donor parent and the controls without receiving food or colostrum. The observed number of dead and venous blood sampling at the time *jugulaire* 0 hour and 8 hours after ingestion of colostrums, andthen continued at 16 hours and 24 hours after ingestion. The blood was centrifuged immediately and the plasma tube was inserted in the micro to be analyzed, given data collection of the number of neonates, which died over the treatment. Laboratory analysis was using SRID technique (single radial immunodifusion).

RESULTS AND DISCUSSIONS

Average (ā) IgG blood serum of young goats can be seen in the Figure 1below.

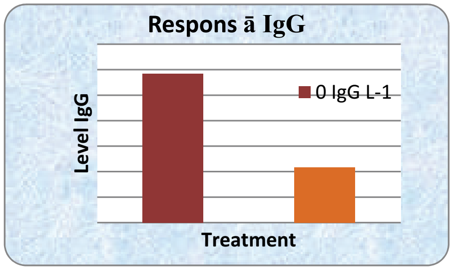

Figure 1. Level of IgG Serum Level of Goat

If the content of IgG plasmatic down less than 10 gL^{-1}, it can lead to death in young goats (Aissata, 1997). Mortality in kids often occurs because the content of goat IgG was low (O'Brien and Sherman, 1993). The low content of IgG plasmatic in ruminant animals can be caused by insufficient colostrum consumption (Levieux, 1984). Figure 2 presents the effect of equine colostrum IgG treatment on IgG serum of goat.

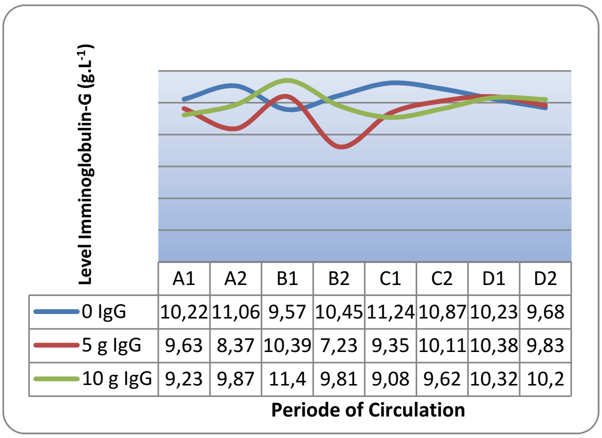

Figure 2. The effect of treatment of 3 level of IgG lyophilized on IgG serum of Goat

The Figure 2 above, shows that time period factor responds to the varying blood serum IgG levels. There were no interactions between the above-mentioned factors ($P>0.05$). These results reinforce the notion that passive transfer of IgG antibodies to 10 g IgGL^{-1} can tolerate well and did not cause any death in young goats, so that the immunoglobulin protein is very important to control the pathogenic agent *exuthero*. Factors such as the amount of nutrients in the diet and fat PK played a role in antibody levels (Bulla et al., 2004). These conditions to be stable when young people are not infected with different pathogenic microorganisms (Duarte et al., 2009).

CONCLUSIONS

Treatment of equine IgG colostral from 0 up to 10 g IgG L^{-1} has not raised significantly the level of total serum IgG of experimental animals. The use of horse IgG colostral is in anticipation for the handling of passive transfer of antibodies. The acquisition of passive transfer of IgG antibodies to 10 g IgG L^{-1} can tolerate well and does not cause death in young goats, so that the immunoglobulin protein will be used as a natural biochemical agent in handling failure of passive transfer in young goats.

RECOMMENDATION

Therefore it is recommended to use equine colostrum IgG for the passive transfer of antibodies in the treatment pathogenic agent, so the neonate mortality could be minimized, especially in the farm pattern of traditional maintenance in Indonesia. It is expected that livestock production, which is traditionally handled as practiced in Indonesia, will further increase, and in turn will improve the benefits of its farmer.

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