ARTIGO 239

METABOLISM OF NEWBORN

Metabolismo dos recém-nascidos

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ABSTRACT: This paper aims to describe the main considerations regarding the metabolism that occurs in young animals, especially in chicks, piglets and calves. To ensure the survival of all species, even in conditions of scarcity of nutrients in the environment, the animals are capable of storing excess calories consumed and not required to meet their metabolic needs immediate, such as lipids, proteins and carbohydrates. However newborn animals are warm-blooded imperfect, heating and cooling with ease, and thus difficult to maintain their survival. The adaptation to the "outside environment" requires major changes in the physiology of the new adaptive be simply guess the temperature in uterus is much higher than the environmental one (in most cases) especially if the animal is born in cold in winter or homeless. Such variations may vary between different species With this it is necessary to study the physiological processes that occur in newborn animals is of great importance for us to evaluate our current conditions of handling and increasingly improve the chance of making animals each rather less stressed at his birth.

Keywords: animals, thermoregulation, temperature, youth

RESUMO: Os animais possuem diversas alterações em relação ao seu metabolismo durante toda a sua fase de produção, especialmente quando consideramos o ambiente como fator preponderante nesse aspecto, pois se trata de um precursor de diversas funções metabólicas e que podem reduzir ou inibir algumas funções produtivas dos animais. Nesse contexto, essas influências ambientais são mais tratadas e, muitas vezes, mais estudadas, em animais adultos, mesmo sabendo que os recém-nascidos são, na maioria das vezes, mais influenciados pelo ambiente e que os efeitos nessa fase podem comprometer a fase adulta do animal. Dessa forma, este trabalho objetiva relatar as principais alterações nos recém-nascido em relação às mudanças em sua fisiologia, onde abordaremos de aves, suínos e bovinos.

Palavras-chave: comportamento, fisiologia, produção

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INTRODUCTION

To ensure the survival of all species, even in conditions of scarcity of nutrients in the environment, the animals are capable of storing excess calories consumed and not required to meet their metabolic needs immediate, such as lipids, proteins and carbohydrates. By being hydrophobic lipids can be stored in bulk dispensing with the participation of water as a solvent and contains, per unit mass, more than twice the stored energy than the other two components, providing more metabolic energy when oxidized.

Adipose tissue is the major reservoir of energy in the body. Adipocytes are the only cells specialized in storage lipid triacylglycerol in the form of their cytoplasm, without this being detrimental to their functional integrity. These cells possess all of the enzymes and regulatory proteins needed to synthesize fatty acids (Lipogenesis) and store triacylglycerol in periods when energy supply is abundant, and to mobilize them for lipolysis when there is deficit of power supply, or in situations of cold, where the need for endogenous heat generation is greater, especially for newborn animals.

In mammals, two types of adipose tissue: white and brown. The mature white adipocyte triglyceride stores in a single large lipid droplet occupies 85-90% of the cytoplasm and the nucleus and pushes a thin layer of cytosol to the cell periphery. Already brown adipose tissue uses these fatty acids by mechanisms less energy efficient, since they induce essentially the transport of fatty acids, processes which represent a high energy consumption and production of heat which is transferred to the circulation and main factor independent of shivering thermo genesis muscle. The brown adipose tissue is so fundamental functions of survival and adaptation to cold exposure plays an important role in survival in cold environments, in the transition from the hot to the cold outside the womb, awakening from hibernation, during cooling of sleep, on hatching egg and shortening of photoperiod or in life in aquatic environments.

The newborn animals are homeothermy imperfect, heating and cooling with ease. It is known that cooling of newborns is accompanied by increased mortality. The heat losses are higher in the newborn, because he proportionately larger body area to weight ratio and lower thermal insulation (less subcutaneous tissue). Heat loss is mainly performed by irradiation to the outside environment, and to a lesser extent by evaporation through the lungs, skin, through the elimination of feces and urine (Morais 1992). Thus this increased heat loss, beyond the larger body area,

amount of fat, often not sufficient to maintain homeothermy and as this young animals, behave differently when the adults in cold conditions, ie, do not raise your metabolism enough to increase food intake but to seek alternatives to generate or gain heat.

There is a temperature called the thermal neutrality, which is the minimum expenditure of energy to maintain the body temperature, which allows to keep the body temperature of the normal animal. Every effort should be made to good care in order to maintain the temperature in the environment of thermal neutrality (SANGA 2000, RAEVE et al 2001). The ineffective thermoregulation is a constant concern of animal scientists working with young animals. The awareness of the importance of assistance in the care and prevention of aspects that negatively influence thermal dysfunction of newborn animals is critical, it is expected that the application of knowledge, based on various practices found, can contribute to improving the quality of life young animals, improving consequently the development and production efficiency.

Thus, this paper aims to describe the main considerations regarding the metabolism that occurs in young animals, especially in chicks, piglets and calves.

CHARACTERISTICS OF NEWBORNS

The time of delivery is one of the great moments of physiological changes to the newborn, with a view that leaves the fetal and uterine environment to join an extremely hostile environment. In the uterine physiology is completely different from the external environment when it leaves a well protected environment to suffer all kinds of external stimuli. Perhaps this is the moment when the animal organism undergoes the biggest transformation and environmental assaults.

The adaptation to the "outside environment" requires major changes in the physiology of the new adaptive be simply guess the temperature in uterus is much higher than the environmental one (in most cases) especially if the animal is born in cold in winter or homeless. There is a certain degree of development of the animal at birth and which is characteristic of the species, so that the newborn can be more agile or more developed in their movements soon after birth. It is true that the more immature greater tolerance to variations, otherwise die very easily and the body cells seem more tolerant. Yet all newborns should receive maternal care and even when man creates, it should be well protected and fed. Apparently one of the

elements that are born with low maturity is the hypothalamus which has difficulties in maintaining thermoregulation at adequate levels.

BODY TEMPERATURE

Animals can be divided into two categories as to control its internal temperature, those who do not control their temperature heterothermy are called, and those who control its temperature are called homeothermy (PAULI 1979). This ability of warm-blooded animals to maintain their body temperature almost constant over the environmental temperature has stimulated the curiosity of men over time. Understanding the basic mechanisms of heat production (thermo genesis) and its dissipation (heat loss) (Garcia 2002) are essential for the development of techniques and protocols which control and maintain the temperature of the animals are essential for the maintenance of life.

The first experimental observations showed that thermo genesis depended on the reactions involved in the metabolism and the maintenance of homeostasis demanded adequate supply of oxygen to the tissues. According to the ideas, Lavoisier (1993) proposed that the oxygen consumption would be small when the animal, fasting, were kept at the temperature comfortable. However, increase oxygen demand during exercise and after ingestion of food or low ambient temperature (Garcia 2002)

The animal remains, despite variations in temperature, the internal temperature (Bligh 1973). That should the existence of regulatory mechanisms that control effectively the production of body heat. In cold environments, the heat generated inside the body should be maintained, while in hot environments must be dissipated to the environment. The internal body temperature thus depends on this balance (Garcia 2002).

In 1876, Claude Bernard showed that animals exposed to cold heat produced from muscular contractions in the shivering chill (thermo genesis mechanical) and exothermic biochemical reactions (chemical thermo genesis) (Garcia 2002). Thus, in animals when subjected to an environment that cools slowly, can compensate for their heat demand by increasing their basal metabolism, thermo genesis without resorting to mechanical.

The chemical thermo genesis, although slower than mechanical thermo genesis, is the most important for the maintenance of body temperature. The heat is produced in the body by the exothermic reactions occurring in the metabolism of fats, proteins and sugars (Pauli 1979). Fats are a

very important source of thermal energy as seen previously, especially those located in brown adipose tissue. The cells of this tissue easily convert the energy of their stocks (Garcia 2002) generating a good amount of heat.

Any newborn for tougher it is, needs to be protected against the cold and wind currents. Thus, there is always need for good heating of the environment, suitable floor (not very cold absorber) which can vary according to the type of pet and availability of the producer. Anyway, the hardwood floors are better than cement in hutch or stalls for pigs. The use of straw also heats up but must be constantly changed due to discharge of urine and feces (because of easy absorption). The side walls are also important for reflecting avoid excessive heat or winds "piped", the same applies to the lining of the roof of the shelter as asbestos shingles are much more calorie than the clay, in addition, the paint with the outside light color (i.e. white) and black on the inside "refreshes" the environment.

WATER BODY

Water is extremely important for the survival of living beings. Your content shelters minerals (electrolytes) dissolved and maintains a concentration that can not undergo large variations or prolonged. For example, the concentration of sodium (Na +), chlorine (Cl $^-$) potassium (K $^-$) are directly involved in nerve impulse besides calcium which also plays a key role in various cellular functions and the extracellular fluid. The animals at birth have a higher content of body water than adults and for this reason are more susceptible to dehydration and its relative body surface is greater than in adults. For example, equine birth even have 90% body water, while adults of various species have water contents from 62% to 70%. For this reason should not miss water "ad libitum" for animals and in the case of dehydration do not forget to replace the water and electrolytes (pure water without electrolytes, can be fatal for electrolyte imbalance).

THE BROWN ADIPOSE TISSUE

In 1912, Polimanti was the first to highlight the importance of brown adipose tissue thermogenic like element, but only through the work of Silverman and Berger (1958) is that have demonstrated the importance for heat generation in the body of warm-blooded animals. Garcia, (2002) showed that brown fat is the primary substrate for thermogenesis chemistry. This tissue is found throughout the body, but mainly in the scapular, subscapular and axillary. Your cells are innervated by

sympathetic and have loads of mitochondria, which explains the high capacity heat generation.

The fabric is called multilocular brown fat because of their brown coloration which is determined by the rich vascularization and the presence of large amounts of cytochromes present in mitochondria, giving this coloration. The cells in this tissue are smaller than the common adipose tissue have polygonal shape and form compact masses similar to endocrine glands. Furthermore, these cells are loaded with lipid droplets in their cytoplasm and have numerous mitochondria (JUNQUEIRA & lack NASCIDOEIRO-1990)

This tissue plays an important role in thermogenesis of higher mammals, it is a place of great heat production. Presents abundant in animals that hibernate. It is known that brown fat has significant importance in the first phase of life, animals that have, in which the amount of this fabric is great and responsible for the production of heat, protecting the newborn from the extreme cold caused by the gradient temperature between the mother's body and the environment.

This fabric when stimulated by the sympathetic nervous system present in the nerve endings around the cell, it oxidizes readily. Multinocular tissue cells generate energy as heat much more than in the form of ATP. The initiation of feeding (hunger) appears to result from a transient decrease in the concentration of serum glucose and thereby triggers the sympathetic nervous system with production of catecholamines which stimulate brown fat to produce heat. After the food intake temperature reaches a threshold, and stopping will need to continue feeding. This mechanism seems to occur in the newborn (MARCONDES, 2002).

PHYSIOLOGY OF THE REGULATION OF BODY TEMPERATURE

The heat is generated mainly in the liver, brain, heart and skeletal muscle (Garcia, 2002). There are numerous factors that affect thermogenesis, but they are all related to the metabolism interecém-born food. Some situations alter the basal rate of production and loss of heat. Sleep, malnutrition a hypo-thyroid gland function, reduce the basal metabolism. On the other hand, hyper-functioning thyroid, the states of permanent muscle tension, the chill, nutrition and exercise promote its elevation (Garcia, 2002).

Body temperature is regulated almost entirely by control mechanisms nervous *feedback* with nearly all of them running through a thermoregulatory center located

in the hypothalamus. However, for these feedback mechanisms may act, it is also necessary presence of temperature sensors to determine when the body temperature becomes too hot or cold (Guyton and Hall, 1998).

Body temperature is maintained by the balance between production processes is heat removal. This control is done by the hypothalamus gland in the walls and roof of the third ventricle of the brain. The lesions produced in the anterior gland leads to the appearance of a hyperthermia, while the destruction of the posterior hypothalamus produces hypothermia (Harrison, 1962). Today it is known that the previous control regions thermolysis, while the later are related thermogenesis. The control of heat production is done by hormones, which enhance the metabolism and also through the chill and horripilation while the thermolysis process is controlled by peripheral vasodilation and sweating (Guyton, 1998).

The cooling of the preoptic area of the hypothalamus also increases the production of thyrotropin-releasing hormone from the hypothalamus. This hormone is taken through the portal vein the hypothalamus to the anterior pituitary, where it stimulates increased production of thyroxine by the thyroid gland. The increase of thyroxine increases cellular metabolism throughout the body.

THERMOREGULATION OF THE NEWBORN

When the young animal is subjected to cold environment, responds with vasoconstriction of the arterioles of the deep layer of the dermis, reducing blood flow to warm the deep parts of the peripheral parts. This response, although it is not the first line, is present in newborn animals. The most important mechanism is the chemical thermogenesis without shivering through metabolism of brown fat of animals that have. The animals born prematurely, ie premature have little brown fat and can not further increase its metabolic level of 25%. As a result there is an increase in oxygen consumption, and this increase was less efficient in preterm infants, who have less capacity to mobilize oxygen. Consequently, the premature is the limit of their ability to thermoregulation (KENNER, 2001), thus the care of premature animals should be higher, especially for little ability to control temperature when compared to animals born at full term even knowing that they have difficulties with the same procedure.

Sympathetic stimulation or epinephrine, and to a small degree, norepinephrine circulating in the blood can cause an

immediate increase in cellular metabolism. This effect is called chemical thermogenesis. However, it is rare in adults, which increase thermogenesis chemical heat production by more than 10 to 15%. In infants, however, the chemical thermogenesis can increase heat production by up to 100%, and is probably very important factor in maintaining the body temperature of the newborn (KENNER, 2001).

In newborns, the heat loss is increased because of the larger surface / body mass which results in greater loss of heat by evaporation. Once the newborn has thin skin, peripheral circulation and superficial subcutaneous tissue scarce, this has reduced thermal insulation, heat lost by not being able to bend the ends of the trunk to prevent heat loss, keeping in extent and exposing most of her body surface.

Hypothermia or hyperthermia, can cause serious changes in vital signs (including tachycardia or bradycardia, tachypnea and apnea) and increased energy consumption. Hypothermia increases oxygen consumption, so that when it starts, the skin temperature decreases first, without intervention, the core temperature falls and hypothermia can result in irreversible, taking the newborn to death (KENNER, 2001). During hypothermia, the body tries to compensate by increasing the basal metabolic rate. If this rate increases above the normal baseline, energy supplies may be exhausted, leading to acidosis. This, in turn, cause changes in subcutaneous tissue, reducing peripheral perfusion can lead to a cessation of bleeding and gastrointestinal motility. Hypoglycemia can also occur as the glucose is metabolized in an effort to meet the demands of cellular energy. Less commonly hypothermia causes bleeding disorders (KENNER, 2001).

Other changes that may result from hypothermia include pulmonary vasoconstriction, decreased surfactant production and impaired weight gain (MARCONDES, 2002). In relation to body weight, normal metabolism of the newborn is approximately twice the adult's metabolism, which also explains the fact that the cardiac and respiratory minute volume being two times higher in newborn (Gayton & HALL, 1998), however, as the body surface area is very large relative to body mass, the body loses heat easily. As a result, the body temperature of newborn falls easily.

In response to the thermal imbalance, the newborn subjected to cooling presents postural change (bending), agitation, chemical thermogenesis and peripheral vasoconstriction, with increasing cellular metabolism and burning brown fat, which has purpose of generating heat in a

situation of cold stress. In adults, the chill is the most important mechanism for regulating involuntary heat production, whereas in the newborn predominates thermogenesis without shivering

These factors related to the biological characteristics and thermogenesis, as well as excessive manipulation, justifying the need to dispense care and special features to newborns in order to maintain their body temperature, since they do not support large temperature variations.

BIRDS NEWBORN

The first two weeks of bird life are the most critical. No other period or phase of life demands much care and attention by the producer, as mistakes can not be corrected in the future, thus affecting the final performance of the birds.The chicks in the first week of life are more susceptible to stressful situations, and may suffer an impaired immune system, are vulnerable to disease and, therefore, giving a yield less productive than expected.

Productivity, expressed in weight gain and feed conversion of broiler, depends on the interaction between variables such as weight post-hatching, dietary nutrients, water quality and temperature. However, the development of the chick, especially during the first week of life condition is relevant to the future performance of the animal physiological processes such as cell hypertrophy and hyperplasia, thermoregulatory system maturation and differentiation of the gastrointestinal mucosa, markedly influence the body weight and feed the bird to slaughter age (Furlan, 2006).

According to Newberry (1999), young birds are motivated to look for opportunities to explore new stimuli. Chicks show a greater motivation to incorporate the peripheral space if it contained new embedded objects daily, essential resources of food, water, heat source or additional resources litter and perches. With the cold, as an intuitive feature of the bird, chick begins to chirp incessantly seeks to protect the back portion seeking sources of heat, running the risk of overcrowding, with suffocation and death or growth retardation future.

To occur body growth, some metabolic precursors must be available. During the last stage of embryonic development of birds, the yolk is a supplier of nutrients being paid up in the abdominal cavity in the last days of incubation.

At the stage of embryonic development, the yolk sac is the only energy source for the bird. Its lipid content is transferred to the circulatory system in the form of lipoproteins. Next to the outbreak, the

remaining yolk sac integrates into the abdominal cavity and, at birth, the intestine contains a viscous material coming from the yolk (Noy & Sklan, 2008). During hatching, the yolk approximately 8 grams, representing 20 to 25% of the weight of the bird. At this time the yolk is made of 46% water, 20% protein and 34% lipids, particularly triglycerides and phospholipids, also containing small amounts of cholesterol esters and free fatty acids, being described as a temporary source of power to bird until another source is supplied through the diet. Its absorption begins shortly after the onset of a reduction in reaching 50% of initial weight during the first 48 hours of age bird (Chambelee et al. 1992)

In birds, two-way use of the yolk sac are described in the first involves secretion into the intestine through the vitelline stalk before and after hatching, and the second main form in the embryonic stage by transporting lipids for circulation. During the first 48 hours use of the yolk sac through the circulatory system remains functional, however, after this time, the transfer begins to decrease. Lymphoid cells clog the yolk stalk 4 days after hatching. Evaluating the transfer of fatty acids and insulin to the intestine and circulation Noy & Sklan (2008) observed a decrease in transfer 48 hours after hatching.

From the physiological point of view, the bird is born with a small reserve of carbohydrates. At birth, there is an inverse relationship between weight and liver glycogen stores, resulting in an increased metabolic demand for heavier birds. Even if this profile can be sustained at birth, the birds have a great capacity for gluconeogenesis when you have access to carbohydrate supplementation through diet (Moran, 1989). Although there is the idea that one of the functions of the yolk is the power supply at the beginning of the bird's life, the amount of energy supplied from the same reaches 9 kcal, not meeting their requirements on the first day of life.

Noy & Sklan (2008) using marker substances observed on the distribution of the yolk proximal and distal portions of the gut, one day before and 6 hours after hatching. The authors observed a greater proportion of yolk in the distal region, one day before hatching. This demonstrates slight hydrolysis occur in the intestinal lumen although there lipase activity during this period. After the outbreak was a higher proportion of yolk in the proximal region of the intestine, and this indicates that there is an increase in movements Antiperistaltics after hatching, thus justifying these results.

In the period immediately after hatching, various changes occur in the small

intestine of birds. The processes of digestion and absorption are not very efficient and sudden passage for feeding exogenous promotes the development of the gastrointestinal tract and glands (liver and pancreas) involved in the processes of digestion.

NEWBORN PIGS

The newborn piglet despite being neurologically developed, is still physiologically immature and some important changes occur at the beginning of his life, enabling him to survive. These changes occur mainly in the first weeks of life, where his thermoregulatory system is still inefficient effectively keep their homeothermy.

Currently, the modern genetic lines of pigs have different productive performance, compared to those available for two decades. Brown-Brandl et al. (2001) showed different patterns for thermoregulatory pigs in the growing and finishing phases. However, few reports in the literature highlight the behavior and physiology of suckling piglets. Most studies involving behavior is performed with growing-finishing pigs (Scott et al., 2006). Pandorfi (2002) assessed by observing behavior, supply of different heating sources for suckling piglets, without involving however, studies or development milk intake thermoregulation. The newborn piglet has limited available energy reserves stored as glycogen and less than 1% of body fat, and little by insulating body hair. Thus, it becomes necessary to suck at birth, avoiding drastic fall in blood glucose levels and thus the body temperature. The normal value of 100 mg glucose per 100 ml of pig's blood at birth can drop to 10 mg or less for the first two days where the animal is subjected to fasting. He has, in the first hours of life, only with glucose catabolism from liver glycogen as their main source of energy, which is just enough to cover their needs for 15 to 20 hours.

Even nursing the piglet may have hypoglycemia associated with stress caused by cold or combined with inadequate milk supply by the sow. English(1998) emphasized that hypothermia is a major cause of mortality in newborn piglets. Practice is already known and very important to manage the monitoring of all births in the maternity ward. The feeding of piglets shortly after birth has aimed to improve the conditions of birth, improve the live birth index / delivery and avoid losses of piglets at birth and also loss of matrices that may die due to problems during the procedure, if not there is immediate assistance. Besides

avoiding losses of piglets at birth, another advantage that can bring this practice is to ensure that the pig has access to the first nut milk (colostrum) shortly after birth. The first suckling piglet has great importance and eventually influenced throughout the health and survival of the animal during its production cycle. The importance of colostrum intake for piglets is due to the fact that the animal is born with virtually no protection against pathogens, which are in their new environment, in addition, all antibodies or immunoglobulins developed by nuts and give protection piglets against infection are not transferred to these animals by the placenta and therefore the only way to make sure they get this protection is through the first nut milk. Immunoglobulins and antibodies present in colostrum are transferred to the digestive tract of the pig and go immediately into the bloodstream. However the pig has a limited capacity to absorb these antibodies due to the fact that the pig intestinal wall becomes impermeable to immunoglobulins quickly. It is estimated that the absorption capacity starts decreasing after birth and from 24 to 36 hours after delivery has no longer occurs.

Pereira & Passos (1998), working with newborn piglets in which the variation of body temperature was monitored, concluded that the temperature control system with the use of escamoteadores and heating are essential to help newborn piglets in maintaining your homeothermy, which was confirmed by Pandorfi (2002). Mortality in maternity, about 70% occur in the first week of life. The causes are numerous and the vast majority of non-infectious nature, as Crush and starvation. Starvation in turn caused because of agalactia, exposure to cold or bleeding navel. In the absence of artificial heating the piglets who are not breast fed primarily become hypoglycemic and seek to heating by the mother. This often results in the crushing of individuals. Piglets weaker are the hardest hit, accounting for about 65% of total losses at this stage.

The increased weight gain during suckling present positive effect in the subsequent phases of animal growth. Thus, the description of the behavior and physiological parameters of piglets in lactation is crucial to propose management techniques that best fit the new genetic lines of pigs in commercial farms.

In some breeds of pigs hypoglycemia occurs shortly after birth which leads the animals to death, so in such animals is important to the addition of sugar (glucose) to the drinking water of the same. A few years ago it was believed that the problem came of all piglets, but today we know that

no gene transfer (racial). Hypoglycemia produces a temperature drop that becomes incompatible with the life of animals.

CATTLE NEWBORNS

The first two weeks represent the most critical phase in the life of newborn cattle. Perinatal mortality is characterized by accidents during delivery, stillbirths and mortality during the first hours of life, represents around 5 to 10%, which corresponds to half the mortality occurring in the first year of life. Already mortality that extends from the neonatal period up to one year, is due to diarrhea in early life, usually attributed to colibacilos, sadness bovine pneumoenterite and blackleg and other diseases that affect the calves.

The sindesmocorial bovine placenta protects the calf of most bacterial and viral attacks, but also prevents the passage of serum proteins and especially immunoglobulins. The newborn is therefore devoid of antibodies and thus particularly sensitive to infections, acquiring a true immunological protection only after ingestion of colostrum.

It is known that the intestine of newborn calf absorbs protein only during the first postnatal hours. The immunoglobulins are absorbed by a mechanism called micropinocitose form of small globules of different sizes. The molecules pass through the membrane of epithelial cells and embryonic walk toward the base of the cells. Then make the blood circulation through the lymphatic channels exclusively. Early research showed that the intestinal absorption of proteins occurs primarily in the jejunum. However, some researchers claim that there is no variation in absorption between different segments of the small intestine. More recent studies show that intestinal absorption peak is located in the last portion of the small intestine, jejunum and ileum.

The uptake of immunoglobulins by micropinocitose and transfer to the lymphatic circulation are twoindependent mechanisms. It is known that the absorption of immunoglobulins is a uniq ue property of embryonic cells of the intestinal epithelium of the calf. Immunoglobulins are the lymphatic circulation, then they gain the bloodstream through the thoracic duct. The path is different for the lower weight molecules, such as serum albumin, the β-lactoglobulin and α-lactalbumin, which pass directly from the lymphatics into the bloodstream. Immunoglobulins appear in the bloodstream after three or four hours of ingestion of colostrum by the newborn.

In calves that do not receive colostrum immunoglobulins are synthesized in the

intestinal Payer plates and in the crypt of the small intestine mucosa. However, immunoglobulin levels will be enough for real protection after a month of life.

FINAL THOUGHTS

With the increase in the degree of confinement of animals, the environment has been changing for quite artificial. Thus, the facilities must be designed carefully so that they do not become a problem in creating, enabling appropriate development of animals, especially newborns, which are often overlooked by producers, even though they are adults ahead.

The study of the physiological processes that occur in newborn animals is of great importance for us to evaluate our current conditions of handling and increasingly improve the chance of making the animals less and less stressed with his birth, due to many changes that occur during this period, which allows for more development of the calves, reaching even better results.

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