

PHYSIOLOGY AND PATHOLOGY OF THE PERINATAL PERIOD IN NEWBORN RABBITS

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The perinatal period of homeothermic animals comprises the transient phase of a creature between the final stage of fetogenesis and the beginning of the juvenile growing phase. In the domestic rabbits, *Oryctolagus cuniculus*, the perinatal period begins at about the 28th day after mating and goes until the end of the second week of life. In rabbits the development of the organs and the fetogenesis is finished with the 28th day of pregnancy, and fetuses born at this time are viable. Fetuses born before the 28th and after the 36th day after mating are not viable (Lösing, 1979). Most of rabbits are born between the 31st and 34th day of pregnancy. At birth the newborn rabbits show distinct fetal characteristics like closed eyelids, sparse lanugo haircoat, reflectoric motility and fetal red blood cell picture (megalocytosis, polychromasia, normoblasts). The newborn rabbits are strict nidicolus animals which need essentially the thermoregulating nest in the first two weeks of their life to protect them against critical thermolysis. During the perinatal period the fetal newborns adapt gradually with the progressive postnatal development to the varying, extrauterine life situation.

The structure of the thermoregulating nest renders possible to the newborns in accordance to the progress of development to shake up the nest and, finally, to leave that, which begins about 12 or 14 days, if a closed haircoat covert the body surface. The body temperature of rectum ( $36,5^{\circ}/37,5^{\circ}\text{C}$ ) and skin surface ( $36,5^{\circ}/37,5^{\circ}$ ) in hairless neonates does not differ. There are no isolation effects in these nestlings to protect them against loss of body temperature to the cooler environment or against high temperatures influences from the environment. Within the closed nest the temperature gradient between body and environment comes to  $3^{\circ}$  until  $5^{\circ}\text{C}$ . After development of a closed haircoat at 4 weeks this temperature gradient between the inside (rectal) of body and the haircoat surface amounts  $3^{\circ}$  to  $5^{\circ}\text{C}$ , too. This temperature situation in the hairless nestlings and in the

haircovered young animals demonstrates the vicarious thermoregulating function of the nest at neonates, which is performed in the older ones by the haircoat.

The adaption of a newborn fetus to the changed extrauterine conditions in nutrition and digestion is accomplished by the suckling. The newborns learn to take up their feed with the mouth and, simultaneously, the gut adapts to the microbial contamination. In the perinatal period the maternal milk is the only feed of newborns. After this period in the third week, the sucklings begin to gnaw feedstuffs in and outside the nest. The milk consumption of sucklings increases until about 20 days after birth and then it decreases. At latest from this time the major part of feed are not milk, but plant products - rough fibres, corn, grass and others - . With the first gnawing of rough fibre feed the gradual transient from the milk to the plant feed begins and is executed about 2 or 3 weeks later. In this time the gut flora changes from the specific milk diet to the rough fibre and plant diet microflora.

The course of the perinatal period is influenced mainly

- by maternal properties, i.e. nestbuilding quality, execution of parturition and puerperium, lactation quality and quantity, litter care, pathogen germ shedding by milk, feces or salive from the doe,
- by neonates, i.e. malformations, stage of body development and weight at birth, vitality;
- by environmental conditions i.e. structural and hygienic nest quality, micro-clima in the cages and nests, noise level and infections pressure in the environment and, at last, the carefulness of the animal keeper.

This last is one of the most important factors for successful rearing of the newborn and growing rabbits.

Disorders in one of these properties endanger the surviving of the very sensitive newborn rabbits in its first life period. The majority of losses in growing rabbits occur in the first week of the perinatal period: about 65 % within the first 5 days and 90 % until 7 days. - The courses of these losses are in chronological succession as followed:

1. death by debility at birth, following underweight or malformations;
2. death by cooling (one of the most frequent causes) following lack nest, wrong nest, wet nest, destroyed nest (by wrong maternal behaviour or excitation), lying outside of the nest or careless keeping;
3. death by nutrition deficiency: following milk deficiency ( puerperal disorder or mammary inflammation), large litters (10 and more) or suckling debility. Undernourishment leads by disturbance of the energy metabolism to loss of body temperature with consequence of cooling. too;
4. death by injuries following cannibalism (by excited does) or accidents;
5. death by infections following lactogenic infections (at earliest 5 days after birth).

With the end of perinatal period the surviving newborn rabbits enter its second life phasis, the juvenile growing period. They become more and more independent of its mothers and nests. From this time disorders in the behaviour of the does as well as in the quality of the nests loose its effectiveness on the healthy development of the young animals.

The key to the prevention of losses in the perinatal period of rabbits lies in the careful management of the pregnant and lactating does and of the newborn litters. The prophylactic or therapeutic use of drugs for control health disorders or deadly losses in the early perinatal period is not effective in the control of losses by cooling, milk deficiency or body injuries, the most causes of death.

Summary:

The perinatal period of newborn rabbits reaches from the 28th day of pregnancy until the end of the 2nd week of life of the newborns. This period is the transient phase for adaption of the fetal neonates to the varying extrauterine life conditions in the juvenile growing phase. Losses in this time are caused by life debility at birth, by cooling (most frequent cause), milk deficiency, body injuries or lactogenic infections. In general, the perinatal losses stop with the end of the first week of life. Careful handling and management of the pregnant and lactating does, and of the litters in the first days of life, are the only measures to control these losses.

Physiologie und Pathologie der Perinatalperiode bei neugeborenen Kaninchen

Die Perinatalperiode neugeborener Kaninchen reicht vom 28. Tag der Trächtigkeit bis zum Ende der 2. Lebenswoche. - Diese Periode ist eine Übergangsphase zur Adaption der foetalen Neugeborenen an die wechselhaften extrauterinen Lebensbedingungen der jugendlichen Wachstumsphase. Die Verluste während dieser Zeit gehen auf Lebensschwäche zum Zeitpunkt der Geburt, auf Unterkühlung (häufigste Ursache), auf Milchmangel, Verletzungen oder lactogene Infektion zurück und treten in der Regel nur bis zum 7. Lebenstag auf. Sorgfältige Betreuung und Pflege der trächtigen und laktierenden Häsinnen und des Wurfes in seinen ersten Lebenstagen sind die einzigen Möglichkeiten zur Verhinderung solcher Verluste.

Psicología y patología del período perinatal en los conejos recién nacidos

El período perinatal de los conejos recién nacidos se extiende desde el vigésimo octavo día de la gestación hasta el final de la segunda semana de vida. - Este período es una fase de transición para la adaptación del recién nacido desde las condiciones de vida fetales a las extrauterinas, cambiantes, de la fase juvenil de crecimiento. Las pérdidas durante este período se deben a falta de suficiente vitalidad en el momento del nacimiento, al frío (la causa más frecuente), a falta de leche, lesiones, o infecciones lactógenas, y se presentan por regla general sólo hasta el séptimo día de vida. La atención esmerada y el cuidado de las conejas embarazadas y lactantes, y de la camada en sus primeros días de vida, son las únicas posibilidades para impedir esas pérdidas.

### Fisiologia e patologia del periodo perinatale dei conigli neonati

Il periodo perinatale dei conigli neonati si estende dal 28<sup>o</sup> giorno di gravidanza fino al compimento della seconda settimana di vita.

- Tale periodo rappresenta una fase transitoria che conduce all'adattamento da parte dei neonati, ancora allo stadio fetale, alle mutevoli condizioni di vita extrauterina proprie della fase di crescita giovanile. Le perdite verificantisi durante questo periodo sono da imputarsi a debolezza corporea presente al momento della nascita, a raffreddamento (causa più comune), a mancanza di latte ed a ferite o infezioni lattogene e compaiono di regola solamente entro il settimo giorno di vita. Una scrupolosa assistenza e cura dei conigli femmine gravidi ed in fase di allattamento, come pure della figliata durante i primi giorni di vita, costituiscono le uniche misure per prevenire tali perdite.

### Physiologie et pathologie durant la période périnatale des lapins nouveau-nés

La période périnatale des lapins nouveau-nés dure du 28<sup>e</sup> jour de la gestation jusqu'à la fin de la 2<sup>e</sup> semaine de vie. Cette période représente la phase transitoire de l'adaptation du nouveau-né foetal aux variables conditions de vie extra-utérine propres à la phase de croissance juvénile. Les pertes durant cette période sont dues à une faiblesse physique au moment de la naissance, à un refroidissement (la cause la plus fréquente), à un manque de lait, à des lésions ou des infections lactogènes qui se produisent en règle seulement jusqu'au 7<sup>e</sup> jour de vie. La seule possibilité pour éviter de telles pertes consiste à soigner scrupuleusement les lapines en gestation et en lactation de même que la portée durant les premiers jours de vie.

