ABSTRACT
Postnatal development can affect the disposition and pharmacokinetics of drugs in man and animals. Factors such as gastric pH, gastrointestinal motility, mucosal absorbing area, microbial population and milk feeding are major determinants in the absorption process of drugs in the neonate. Postnatal evolution in body composition can lead to important alterations in distribution pattern of drugs in newborns. Differences in maturity at birth and in the rate of postnatal development of the renal and hepatic functions are present in the various species. Therefore, important variations in pharmacokinetics and pharmacodynamics between mammalian newborns can be expected for the same drug.

INTRODUCTION
Age is one of the factors which modify the disposition and the actions of a drug. Therefore in the last decade there has been a growing interest in the actions and fate of drugs in neonatal man and animals.

In all species, neonates undergo continuous anatomical and functional changes. Differences between animal species in both the degree of maturity at the time of birth and the rate of postnatal development have been
reported. Differences in the disposition of a foreign compound and in its pharmacodynamics between young animals of different species can, therefore, be expected.

The present study deals with the influence of postnatal growth on absorption, distribution and elimination of drugs in animals and man in the neonatal period. These factors will be discussed in the light of anatomical, physiological and biochemical developments.

**ABSORPTION**

Absorption of drugs from the gastrointestinal tract of the newborn is determined by a variety of continually changing factors. Some of these factors are listed in Table 16.1.

**Gastric pH**

In the human neonate, gastric pH is between 6.5 and 8.0 at birth, and it fluctuates considerably thereafter and takes several months to reach adult levels. In newborn calves, the abomasal pH is 7.5, but it drops in a few hours to 4.0; on changing to solid food in the following weeks, the average pH of the abomasum is 3.6. A diminished breakdown of, for example, penicillins, with a higher bioavailability can therefore be expected, and has been found in very young humans and calves.

**Gastrointestinal motility**

Another major determinant in the drug absorption process is the development of gastrointestinal motility. It is generally accepted that, in the newborn, a lack of propulsive activity affects the transfer of orally administered drugs and leads to delayed absorption. In neonates, it takes 6-8 months before the gastric emptying time approximates to adult values. In dogs also, a foetal pattern of propulsive activity in the intestine is present in the first weeks of postnatal life. Adult patterns of motor activity were registered in the small bowel of the newborn lamb; the development of functional reticuloruminal activity however only starts after birth.