Morris et al. (1985) exposed 16 pigs to 0, 200, or 250 ppm from gestational day 109 until birth (maternal COHb at 24 h into the exposure was 0, 13.6%, and 17.1%, respectively). Stillbirth rates for the three groups (total of 123 piglets) were2.3%, 2.4%, and 4.8%, respectively. The study authors stated that the stillbirth rate was not affected because the observed rates were lower than the industrial norm of 5-10%. The COHb in neonatal piglets at birth were 0, 19.8%, and 22.4%, respectively. The authors found impairment of negative geotaxis behavior and open field activity 24 h after birth in the 250-ppm group. Activity in open field was significantly reduced at 48 h after birth in piglets from both exposure groups.

3.3.2. Rabbits

Astrup et al. (1972) reported an increase in fetal mortality and malformations in rabbits exposed to CO at 180 ppm continuously throughout gestation. Maternal COHb was 16-18%.

Rosenkrantz et al. (1986) exposed rabbits to high concentrations of CO-containing cigarette smoke (12 puffs of CO at 2,700-5,400 ppm; exposure to puffs of cigarette smoke by face mask; each puff sequence consisted of 30 s of cigarette smoke and 30 s fresh air) for 12 min daily from gestational days 6-18. The COHb level reached at the end of each exposure was 16%. A large number of fetal deaths, but no malformations were observed in exposed animals.

3.3.3. Rats

Choi and Oh (1975) exposed rats to CO at 750 ppm for 3 h/d on gestational days 7, 8, or 9. An excess of fetal absorptions and stillbirths as well as a decrease in body length and an increase in skeletal anomalies were observed. COHb was not determined.

Penney et al. (1980) exposed pregnant COBS rats for the last 18 days of gestation to CO at 200 ppm. The mean maternal COHb was about 27.8%, and the mean fetal level was 27.0%. The body weight of the pups was significantly lower than that of controls. The heart weight of both exposed females and pups was significantly increased.

Mactutus and Fechter (1985) exposed Long-Evans rats continuously throughout gestation to CO at 0 or 150 ppm. Mean COHb was 15.6% vs. 1% in control subjects. At 120 days of age, CO-exposed rats acquired a conditioned avoidance response equally well as control animals. However, following a 24 h interval, the CO-exposed rats failed to demonstrate significant retention. In a second experiment in which animals received 50 training trials per day until a criterion of 10 consecutive avoidance responses was met, the prenatal CO-exposed rats again acquired the task as well as control animals. When the rats were tested for retention 28 days later, a significant memory impairment was again observed in terms of trials required to retain the avoidance criterion as