BLASTOCYST SIZE IN DUTCH-BELTED AND NEW ZEALAND RABBITS*

G. E. KODITUWAKKU† AND E. S. E. HAFEZ

*Reproduction Laboratory, Department of Animal Sciences,
Washington State University, Pullman, Washington, U.S.A.*

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In the rabbit, blastocyst size varies greatly from one doe to another, and is not apparently related to such factors as the weight of the dam and sire or the age of the dam (Beatty, 1958), and the parity of the female (Hafez & Rajakoski, 1964). On the other hand, lactation and stress cause a reduction in the size of the blastocyst and the diameter of the embryonic disc (Hafez & Ishibashi, 1965), and blastocyst diameter is directly related to the racial size of the parents (Castle & Gregory, 1929). The present investigation was undertaken to evaluate the variation in blastocyst size between two breeds of rabbits of different body size.

Twenty-three New Zealand White (adult body weight 3.2 to 4.2 kg) and thirty-three Dutch-Belted (adult body weight 1.6 to 2.3 kg) oestrous rabbits were mated with two fertile bucks of their respective breeds and injected with 20 i.u. of HCG (Follutein, Squibb). They were killed 144, 152 and 160 hr *post coitum* (*p.c.*), and their uteri flushed with physiological saline for the recovery of blastocysts. The outer and inner zonal diameter and the embryonic disc of the blastocysts were measured in a constant depth of fluid, as described by Hafez & Rajakoski (1964). Of the 230 blastocysts recovered from the New Zealand does, twenty had degenerated and seven ruptured during the flushing process. Of the 168 blastocysts flushed from the Dutch-Belted breed, forty were degenerate and six ruptured while flushing. The 160-hr blastocysts of both breeds were extremely fragile and the ruptured blastocysts from this age group were not included in this study.

Viable blastocysts were recovered from twenty of the twenty-three New Zealand White does, whilst in the Dutch-Belted breed, only twenty-four of the thirty-three does provided viable blastocysts. The percentage of does with viable blastocysts, the number of blastocysts per doe, and the number of corpora lutea per doe were higher in the New Zealand than in the Dutch-Belted breed (Table 1). Dutch-Belted does had more degenerate blastocysts. The data on blastocyst size are summarized in Table 2.

There were no significant differences in the outer- and inner-zonal diameters and the diameter of the embryonic disc between the two breeds. However, the

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† Fullbright-Hays Postdoctoral Research Fellow, U.S. Department of State. Present address: Faculty of Veterinary Medicine, University of Ceylon, Peradeniya, Ceylon.

diameter of individual blastocysts varied widely, even within the same litter, and the range of this variation seemed to vary with the breed. There was a

TABLE I
RECOVERY OF BLASTOCYSTS FROM DUTCH-BELTED AND
NEW ZEALAND RABBITS 144 TO 160 HR *p.c.*

	<i>Dutch-Belted</i>	<i>New Zealand</i>
Total no. of blastocysts	168	230
Does with viable blastocysts (%)	73	87
No. of blastocysts/does* (range)	7.0 (1 to 9)	11.5 (4 to 15)
Degenerate blastocysts (%)	24	9
No. of blastocysts as a percentage of the no. of corpora lutea	97	99
No. of corpora lutea/does* (range)	7.2 (4 to 11)	11.7 (9 to 15)

* Does with no blastocysts are excluded.

TEXT-FIG. 1. Variation in size of blastocysts recovered from Dutch-Belted and New Zealand rabbits 144 to 160 hr *p.c.*

high percentage of under- and over-sized blastocysts in the New Zealand breed at 144 hr *p.c.* and in the Dutch-Belted breed at 152 hr *p.c.* (Text-fig. 1). The individual variation seemed to decline in both breeds at 160 hr *p.c.* Differences

TABLE 2
RECOVERY AND DIMENSIONS OF 144- TO 160-HR BLASTOCYSTS FROM DUTCH-BELTED AND NEW ZEALAND RABBITS

Autopsy (hr p.c.)	No. of does		No. of blastocysts		Diameter (mm)					
					Outer zonal			Inner zonal		
					D	NZ	NZ	D	NZ	Embryonic disc
144	7	6	33	51	3.26 ± 0.61 (2.38 to 4.97)	3.07 ± 0.64 (1.96 to 4.42)	3.20 ± 0.44 (2.30 to 4.87)	3.01 ± 0.62 (1.85 to 4.23)	1.26 ± 0.31 (0.52 to 2.14)	1.05 ± 0.18 (0.52 to 1.38)
152	11	8	62	88	3.68 ± 0.93 (1.68 to 5.44)	4.12 ± 0.65 (2.35 to 5.64)	3.62 ± 0.82 (1.65 to 5.35)	4.09 ± 0.65 (2.35 to 5.62)	1.28 ± 0.25 (0.79 to 1.96)	1.22 ± 0.21 (0.62 to 1.73)
160	6	6	31	64	5.39 ± 0.82 (3.75 to 7.06)	4.83 ± 0.61 (3.13 to 6.17)	5.29 ± 0.74 (3.75 to 7.06)	4.76 ± 0.57 (3.13 to 6.09)	1.46 ± 0.32 (0.85 to 2.08)	1.26 ± 0.25 (0.71 to 1.89)

Mean ± S.E.; range in parentheses.

in blastocyst size within the same uterine horn may be due to differences in the time when eggs are ovulated or fertilized, genetic factors or maternal effects. However, there is no significant difference in the blastocyst size of New Zealand and Chinchilla breeds (Hafez & Rajakoski, 1964). Breed differences in the pre-natal size of rabbits seem to be more pronounced after implantation of the blastocyst.

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