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Brief communication

ACTIVE MAMMARY EXCRETION OF N^4-ACETYLATED SULPHANILAMIDE*)

After administration of sulphanilamide to goats and cows, sulphanilamide is excreted into milk. The concentrations of sulphanilamide in ultrafiltrate of milk (M. Ultr.) and blood plasma (P. Ultr.) are equal and the ratio M. Ultr./P. Ultr. is 1.0. The pK_a of sulphanilamide is 10.4 and thus, sulphanilamide is un-ionized in both milk and blood plasma. Therefore, sulphanilamide is excreted into milk in accordance to the theory of passive diffusion of the non-protein-bound and un-ionized fraction in blood plasma (*Rasmussen* 1958, 1966; *Miller et al.* 1967). A similar ratio was expected for acetylated sulphanilamide with a pK_a of 10.3. However, the concentration of the acetylated derivative is always found higher in milk than in plasma. This might be due to formation of acetylated sulphanilamide in the mammary tissue, as demonstrated by *Rasmussen & Linzell* (1967) or active excretion of the compound just as in the case of N^4-acetylated p-aminohippuric acid (*Rasmussen* 1969).

In order to elucidate the problem acetylated sulphanilamide was infused intravenously in goats using the equilibrium technique described by *Rasmussen* (1958). Acetylated sulphanilamide in milk and blood plasma was estimated according to the

Table 1. Concentrations of acetylated sulphanilamide in blood plasma and milk and in ultrafiltrates of blood plasma and milk.

Animal	Plasma µg/ml	Milk µg/ml	Ratio M/P	Protein-binding plasma %	Protein-binding milk %	Ultrafiltrate of plasma µg/ml	Ultrafiltrate of milk µg/ml	M.Ultr. / P.Ultr.
Goat 5	31	100	3.2	42	17	17.9	83	4.6
Goat 26	16.8	77	4.6	24	8	12.8	71	5.6
Goat 36	24	161	6.7	37	14	15.1	139	9.2
Goat 36	177	1280	7.2	27	24	129	973	7.6
Goat 36	195	689	3.5	29	26	139	510	3.7
Goat 40	24	233	9.7	17	28	20	168	8.4
Goat 40	55	481	8.8	33	22	37	375	10.1
Goat 40	129	614	4.7	23	20	99	492	5.0
Goat 40	201	651	3.3	30	22	141	508	3.6

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method described by *Bratton & Marshall* (1939). From the results listed in Table 1 it is seen that the concentrations in milk are 3—10 times higher than in plasma. The protein-binding in plasma and in milk varies from 17 to 42 % and from 8 to 28 %, respectively and the ratio M. Ultr./P. Ultr. is 3.6—10.1 instead of the theoretical value 1.0 for a passive diffusion. In two of the goats in which experiments were performed at different levels of acetylated sulphanilamide in blood plasma the results point at a decrease in the milk-to-plasma ratios with increasing concentrations of acetylated sulphanilamide in blood plasma.

It might be concluded that not only passive diffusion but an active excretory process is involved in the mammary excretion of N^4-acetylated sulphanilamide.

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