

Brief Communication

**UREA IN BULK MILK AS COMPARED TO THE HERD MEAN
OF UREA IN BLOOD**

Concentration of urea in plasma has been used as an index of nitrogen status of ruminants (*Preston et al.* 1965). High feed protein or increased protein catabolism bring about a rise in the plasma urea level. Low-protein diets, on the other hand, tend to lower the urea concentration in the plasma. Thus, the protein intake, and particularly the ratio of protein to energy, seems to affect the blood urea values (e.g. *Eckart* 1980).

Urea in blood is one of the components in metabolic profile tests (e.g. *Payne* 1970). Besides reflecting protein supply and kidney function the parameter seems to be related to fertility (*Hewett* 1974, *Depke* 1981).

Urea is distributed via the vascular system and diffuses passively throughout the body water (*Kaneko* 1980). The concentration in milk therefore reflects the concentration in blood. Milk samples are easy to obtain and analyses of urea in bulk milk give information about the urea status of the herd.

The concentrations of urea in bulk milk from 14 herds were related to urea in a metabolic blood profile test. The bulk milk comprised both morning and afternoon milk. In small herds (< 21 cows) blood samples were taken from all adult cows. In larger farms samples were taken from 21 cows, chosen to represent various levels of production.

The blood samples were withdrawn from the jugular vein between the hours 1000 a.m. — 1200 noon. Small heparinized bottles were used and transported at a temperature of 4—10°C to the laboratory together with the milk sample. The analyses normally took place on the day following collection. If not, the samples were kept at 4°C and analysed the following day. All samples were processed in a Technicon Auto-Analyzer II according to a method described by the manufacturer.

A good correlation was found (Fig. 1) between herd means of urea in blood and urea in bulk milk ($r = 0.77$, $P < 0.01$).

The urea values obtained in bulk milk will not be affected by the status of dry cows, and low yielding cows will have a rela-

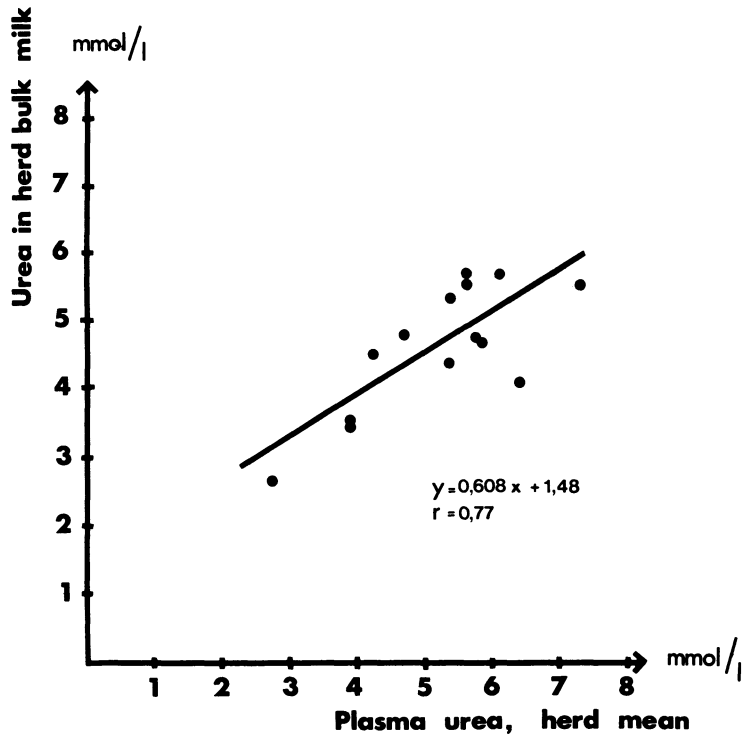


Figure 1. Urea levels in bulk milk as compared to herd means of urea in plasma (14 herds).

tively small influence on the values compared to high yielders. In the blood profile, however, all yielding groups will be equally represented. This is of some importance because the urea values may vary with stage of lactation and yield (Hewett 1974). However, the present investigation indicates that urea in bulk milk can be used for evaluation of the urea status of the herd.

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REFERENCES

- Depke, W.: Untersuchungen zur Konstitution und Fruchtbarkeit an ausgewählten Nachkommengruppen des Deutschen Schwarzbunten Milchrindes anhand von Blutserumuntersuchungen. Diss., Tierärztliche Hochschule, Hannover 1981.

- Eckart, K.*: Bestimmung des Harnstoffgehalts in der Milch — ein Beitrag zur Beurteilung der Protein- und Energieversorgung bei Kühen. Diss., Tierärztliche Fakultät, München 1980.
- Hewett, C.*: On the causes and effects of variations in the blood profile of Swedish dairy cattle. Thesis. Acta vet. scand. 1974, Suppl. 50.
- Kaneko, J. J.*: Clinical Biochemistry of Domestic Animals. 3rd ed. Academic Press, New York 1980.
- Payne, J. M., S. M. Dew, R. Manston & M. Faulks*: The use of metabolic profile test in dairy herds. Vet. Rec. 1970, 87, 150—157.
- Preston, R. L., D. D. Schnakenberg & W. H. Pfander*: Protein utilization in ruminants. I. Blood urea nitrogen as affected by protein intake. J. Nutr. 1965, 86, 281—288.

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