Vitamin A and Vitamin E Distribution in Fractions of Cattle Plasma

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Introduction

Analysis of fat soluble vitamins in different plasma fractions of protein, chylomicrons, and lipoproteins can provide valuable information about their plasma distribution and transport.

Vitamin A (retinol) (A) and vitamin E (alfa-tocopherol) (E) are known to circulate in different plasma fractions; hence they were used for verifing a simple plasma fractionation method by gradient ultra-centrifugation for cattle plasma.

Methods

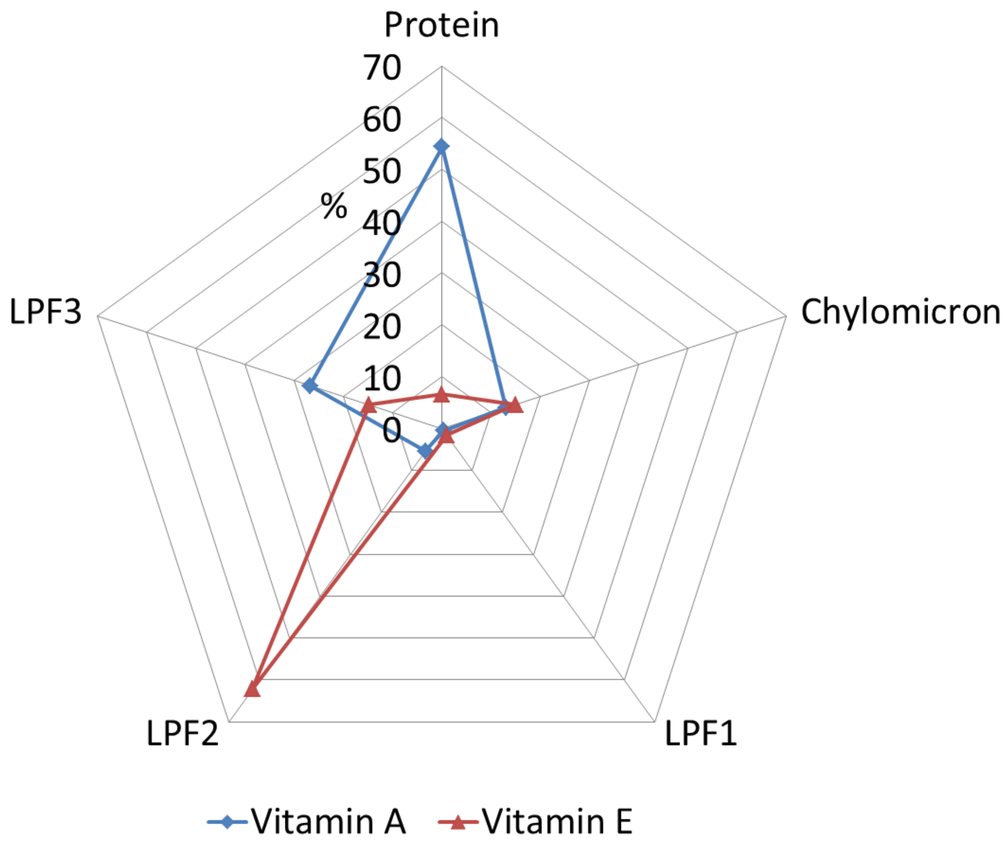
- Blood samples from 3 Holstein bull calves
- Approximately 9 µg A/day and 360 mg E/day
- Plasma isolated by centrifugation 1.500 x g, 10 min.
- Plasma fractionated by gradient ultra-centrifugation
  - 300.000 x g,18 hrs.
  - OptiPrepTM (60% iodixanol)
  - Hepes-buffered saline (0.85%) pH 7.4
- Fractions harvested top-down with Pasteur-pipette
- Fractions analysed for A and E by HPLC

Results and Conclusions

A is transported in chylomicrons from its site of uptake in the intestines but circulates in plasma mainly bound to specific binding proteins, which are responsible for its biological function in the body.

Likewise E is transported from the intestines to the liver in chylomicrons. Binding proteins specific to E is known to exist, but appear to be associated with the heavier lipoprotein fractions in the presented separation method (LDL/HDL)..

This indicates that cattle plasma was effectively fractionated into relevant plasma fractions using the presented gradient ultracentrifugation method,



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