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H. Yamada ˣ
T. Ichihashi
K. Hirano
H. Kinoshita
Shionogi Research Laboratories
Shionogi & Co., Ltd.
Fukushima-ku, Osaka 533, Japan

Received May 5, 1980.
Accepted for publication September 25, 1980.

Lowering Blood Urea Nitrogen with Amino Acid Supplementation

Keyphrases □ Amino acids—dietary supplementation, effects on blood urea nitrogen, rats □ Colorimetry—analysis of blood urea nitrogen in rat serum, effects of dietary supplementation of amino acids □ Dietary supplements—amino acids, effects on blood urea nitrogen in rats

To the Editor:

Currently we are studying the effect of dietary supplementation of amino acids on alcohol metabolism. The amino acid augmentation is based on the fasting plasma profile theory (1–4).

From past work on the metabolic effects of such diets, it was found that they produce a significant decrease in serum cholesterol in rats (5) and humans (6). This observed effect was theorized to be the result of an increase in net protein utilization.

While conducting the present study, we discovered that dietary supplementation of limiting amino acids to the third level (L-lysine, L-tryptophan, and L-threonine), based on the fasting plasma profile theory, produces a significant decrease in serum blood urea nitrogen.

Twenty male Sprague–Dawley rats, 250–275 g, were randomly divided into two groups of 10 each. Following a 2-week acclimation period during which both groups were fed a standard animal diet[1], the first group was fed a diet supplemented to the third level of limiting amino acid (Table I) for 2 additional weeks while the second group was maintained on the standard diet for the same period.

On the 15th day, blood collected by orbital sinus puncture was centrifuged, and the serum was retained. Blood urea nitrogen was measured colorimetrically by means of a standard kit[2].

The serum blood urea nitrogen for the treatment group was 8.45 ± 0.36 mg/100 ml (mean ± *SEM*) while that of the control group was 15.1 ± 0.49 mg/100 ml. A Student *t* test showed a significant difference to the $p < 0.01$ level.

It is theorized that the observed effects are caused by an increase in net protein utilization when the limiting amino acids are supplemented, based on the fasting plasma profile theory, and that this increase reduces the amount of underutilized amino acids that are otherwise available for energy metabolism or storage. The end result is a decrease in the amount of nitrogenous metabolic products (wastes) in serum.

[1] Purina Laboratory Chow.
[2] Sigma Chemical Co., St. Louis, MO 63178.

Table I—Amino Acid-Supplemented Animal Feed to the Third Level of Limiting Amino Acid

Ingredient	Amount, %
L-Tryptophan	0.309
L-Threonine	0.341
L-Lysine	1.667
Standard feed	97.683

This type of dietary supplementation can be of invaluable assistance to those who must reduce their blood urea nitrogen levels (dialysis patients, nephrotic patients, *etc.*).

The major advantage of the augmentation of the body's amino acids based on the fasting plasma profile theory is that it removes a lot of guesswork and establishes a hard mathematical formula for preparing the diet.

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Gregory M. Torre ˣ
Vincent D. Lynch
Charles I. Jarowski
College of Pharmacy and
Allied Health Professions
St. John's University
Jamaica, NY 11435

Received June 23, 1980.
Accepted for publication October 2, 1980.

Effect of Variation of Plasma Oleic Acid Concentration on Relative Concentration of Free and Protein Bound Warfarin

Keyphrases □ Warfarin—effect of plasma oleic acid concentration on free and protein bound warfarin concentration, protein binding, humans □ Protein binding—binding of warfarin to human serum albumin, effect of plasma oleic acid concentration on free and bound warfarin concentration □ Oleic acid—effect of concentration on free and protein bound warfarin concentration, humans

To the Editor:

Although the normal serum concentrations of free fatty acids are between 0.3 and 0.9 mmole/liter (1), pathological conditions such as diabetes, reduced renal function, cardiac infarction, and bacterial disease (2–12) can cause substantial increases in free fatty acid levels. In some cases, these levels can exceed 5 mmoles/liter. Moreover, the increasingly widespread use of intravenous fat emulsions probably is associated with significant variation in the serum concentrations of free fatty acids.

Schwartz *et al.* (13) recently demonstrated that variation in the concentration of oleic acid, a major component in the free fatty acids found in serum, can cause significant variations in the protein binding of salicylate. Similar findings concerning the effect of variation in free fatty acid concentrations on the protein binding of drugs were published previously (14–17).

0022-3549/81/0100-0114$01.00/0