

# **Influence of a liquid nutrient concentrate on lipid metabolism parameters in slightly overweight individuals.**

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## **Abstract**

A nutrient concentrate (manufactured by Nutrition Laboratories, Inc, of Florida, USA) was studied for its ability to influence on some clinical manifestations that are characteristic of changes in lipid metabolism. Such studies usually focus on individuals who are significantly overweight or obese. In this study, however, participants were selected to form a group of individuals who were only slightly overweight, as indicated by an average body mass index (BMI) of 25.2.

35 healthy adults (26 females and 9 males) ingested the nutrient concentrate instead of breakfast for 36 days. They were instructed to make no other changes to their life styles. The participants made no modifications to their lunches or dinners but ate the food they normally would eat.

Measurements of blood pressure, concentration of glucose, insulin, two liver enzymes, total cholesterol, LDL, HDL, triglycerides and certain anthropometric measurements were carried out before and after the trial.

The most significant results of the trial are reduction of blood triglyceride levels—29.5% of the initial concentration. In individuals with increased blood insulin level (hyperinsulinemia), the average decrease of initial level was 22.0%. Blood sugar, insulin and cholesterol levels also decreased.

An unexpected result was a reduction in the activity of two liver enzymes (SGOT and SGPT). This indicates that the nutrient concentrate may have a systemic cleansing or detoxifying effect.

Body weight and body size measurements were also significantly reduced.

## Introduction

Few people, who are concerned about and pay attention to their body weight, realize that being overweight is manifestation of a disturbed lipid metabolism. In order to be able to control ones weight, it is necessary to influence the state of one's lipid metabolism.

The beginning of weight gain is usually accompanied by changes of lipid metabolism. An important manifestation of weight gain is an increase in the circumference of the waist. Harvard Medical School doctors recommend:

*“Rather than being an endorsement for getting fat, these findings may help us to pay attention to our waists, in addition to our weight.*

*For most of us, the plain fact is that weight gain when we're adults is an indication that we are, indeed, getting fatter and therefore very likely at greater risk of suffering from a long list of diseases.*

*It does get a little more complicated in older age. We lose muscle mass and bone density, so while we may weigh the same as we used to, or even less (and congratulate ourselves on being thin), we may actually be lugging around more fat tissue. So we need to keep an eye on our waist size, not just our weight, especially after about age 50. Waist size is a fairly accurate reflection of how much visceral fat we've accumulated in our abdomens. And visceral fat is the metabolically active form of fat that causes so much harm” (1).*

In most studies dedicated to weight loss by dieting, participants are either significantly overweight or obese. Our study examines the beginning stage of weight gain and on the changes in lipid metabolism indicators that are reflected by blood analysis.

### The trial participants, dietary conditions and examinations

Thirty five adult healthy individuals (26 females and 9 males) participated in the trial. They were only marginally overweight, with an average Body Mass Index of 25.2 (normal range is 18.5 - 24.9). In fact, the BMI of the participants bordered on normal.

During the trial, which lasted 36 days, the participants took a liquid nutrient concentrate instead of eating breakfast. They were instructed to make no other changes to their life styles. The participants made no modifications to their lunches or dinners but ate the food they normally would eat. Following the trial, the participants were questioned regarding any side effects experienced during the trial.

In each participant, the following measures were carried out before and after the trial: blood pressure, two liver enzymes SGOT and SGPT, determination in the blood the levels of following indicators of lipid metabolism: glucose, insulin, total cholesterol, low density lipoproteins (LDL), high density lipoproteins (HDL), triglycerides and some anthropometric measurements.

Measurements carried out before and after the trial showed the following average changes for the 35 participants:

**WEIGHT REDUCTION**

WEIGHT LOSS: 2.6 kg (4.0% reduction)

**SIZE REDUCTIONS**

NECK: 0.67 cm (1.9 % reduction)

CHEST: 1.89 cm (2.1% reduction)

WAIST: 4.4 cm (5.4% reduction)

BUTTOCKS: 2.4 cm (2.6% reduction)

RUMP: 2.99 cm (3.2% reduction)

**BLOOD ANALYSIS**

BLOOD PRESSURE REDUCTION: 2.06/1.09 (1.6% reduction)

TOTAL CHOLESTEROL REDUCTION: 9.51 mg/dL (4.7% reduction)

LDL REDUCTION: 4.15 mg/dL (2.0 % reduction)

HDL REDUCTION: 0.13 mg/dL (0.2% reduction)

TRIGLYCERIDES REDUCTION: 35.14 mg/dL (29.5% reduction)

BLOOD GLUCOSE REDUCTION: 11.5 mg/dL (12.1% reduction)

INSULIN REDUCTION: 1.06 IU/ml (12.6% reduction)

SGOT ACTIVITY DECREASE: 0.34 U/L (1.4 % decrease)

SGPT ACTIVITY DECREASE: 0.91 U/L (3.3% decrease)

The results obtained show that the intake of the nutrient concentrate during 36 days instead of a normal breakfast reduces the indicated parameters. The most significant changes concern weight, waist size and triglycerides.

It should be noted that the influence of the nutrient concentrate appears more effective in an individual with elevated blood concentration of triglycerides, total cholesterol, insulin and LDL before the trial since these readings in such individuals showed a greater reduction following the trial.

In five individuals with high level of triglycerides in blood (more 200 mg/dL, ranging from 230 to 315 mg/dL), the average reduction of the concentration of triglycerides was 163.4 mg/dL—60% of the average level of triglycerides before the trial in these five participants.

In 17 individuals with level of total cholesterol in the blood higher than 200 mg/dL, (ranging from 200 to 304 mg/dL), the average reduction of the initial level was 21.8 mg/dL—10% of the average level in these 17 persons before the trial.

In three participants with high blood levels of LDL (more 160 mg/dL, ranging from 126 to 176 mg/dL), the average LDL reduction was 36 mg/dL—23% of the initial concentration of LDL before the trial.

In eight persons with increased blood insulin level (higher than 10 IU/ml, ranging from 10.5 to 20.3 UI/ml), the average decrease of the initial level was 3.2 IU/ml—a 22.0% of the initial level in these eight participants before the trial. In others participants concentration of insulin in the blood before the trial was on normal level and changed insignificantly.

An unexpected result was a reduction in the liver enzyme activity (1.4% reduction in SGOT and 3.3% reduction in SGPT), which indicates that the nutrient concentrate may have a systemic cleansing or detoxifying effect.

As evidenced by the questionnaire that the participants filled out following the program, no comments were made by the participants during the trial indicating side effects such as feeling weak or hungry.

## Discussion

The participants in this trial do not belong to a typical overweight category. Their BMI was an average of 25.2, which is bordering on normal. Nevertheless, the intake of the nutrient concentrate during the trial demonstrates a significant influence on lipid metabolism and body weight.

It is important to note that the nutrient concentrate was used only once per day instead of eating a usual breakfast. The participants made no other modifications to the food intake during the rest of the day (lunch and dinner), nor did they in any other way change their life styles.

It is not surprising that in patients with higher levels of triglycerides, total cholesterol, LDL and insulin the decrease of these blood components was more significant. The greater the lipid metabolism misbalance, the more remarkable can be the influence of an effective remedy to normalize metabolic balance.

The effect of the nutrient concentrate could be explained by the following factors:

(1) A substitution of breakfast with a liquid nutrient concentrate reduces the intake of calories and cholesterol.

(2) Constituents in the nutrient concentrate may reduce appetite and therefore also decrease the intake of substances such as cholesterol.

(3) Some plant compounds in the nutrient concentrate may modulate expression of genes involved in lipid metabolism. The ability of some herbal extracts to influence on gene expression has been demonstrated in experiments with cultivated human cells (2, 3). There is also recent evidence of gene-nutrient interactions with dietary fat (4).

The results obtained in this trial point to a recommendation to control lipid metabolism during the beginning stage of the development of gaining weight. Even with a BMI near 25, the use of a remedy that is capable of normalizing deviations from norm in lipid metabolism, such as the nutrient concentrate used in this study, should be recommended.

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