

# NATURAL VEGETARIAN REPLACEMENT RAW MEAL: METABOLIC MODULATION AND EFFECTS ON OXIDATIVE STATUS

R. De Giuseppe<sup>1</sup>, L. Vigna<sup>2</sup>, C. Novembrino<sup>3</sup>, F. de Liso<sup>1</sup>, D. Sommaruga<sup>2</sup>, A. Cossovich<sup>2</sup>, R. Maiavacca<sup>1</sup>, F. Bamonti<sup>4</sup>

<sup>1</sup> Fondazione F.lli Confalonieri, Dip. Scienze Mediche, Università degli Studi di Milano, Fondazione IRCCS, Cà Granda Ospedale Maggiore Policlinico, via F. Sforza 35, 20122 Milano, Italy;

<sup>2</sup> Dip. Medicina Preventiva Clinica e del Lavoro, U.O. Medicina del Lavoro I, Fondazione IRCCS, Cà Granda Ospedale Maggiore Policlinico, via F. Sforza 35, 20122 Milano, Italy; e-mail: [luisellavigna@inwind.it](mailto:luisellavigna@inwind.it)

<sup>3</sup> Dip. Scienze Mediche, Università degli Studi di Milano, Fondazione IRCCS, Cà Granda Ospedale Maggiore Policlinico, via F. Sforza 35, 20122 Milano, Italy; e-mail: [fabrizia.bamonti@unimi.it](mailto:fabrizia.bamonti@unimi.it)

<sup>4</sup> Laboratorio Patologia Clinica, Dip. Area Servizi Diagnostici, Fondazione IRCCS, Cà Granda Ospedale Maggiore Policlinico, via F. Sforza 35, 20122 Milano, Italy



## Background

Obesity is a fast growing problem that is reaching epidemic proportions worldwide, increasing the risk of cardiovascular disease and premature death. There is evidence that low-grade inflammation and high oxidative stress (defined as an imbalance between Reactive Oxygen Species, ROS, not counterbalanced by an adequate Total Antioxidant Capacity, TAC) are further risk factors. Oxidized LDL (oxLDL), a marker of lipoprotein-associated oxidative stress, is an emerging cardiovascular risk factor.

Development of effective, minimal intervention, sustainable dietary strategies to achieve weight loss is important in providing public health benefits, addressing social needs, and minimizing the risk of dangerous, and misleading dietary weight-loss practices. Formula meal replacements designed for weight loss represent a possible strategy for some individuals and are ever more frequently prescribed in medical practice.

**GoJuvo® is a new commercial plant-based vegetarian meal consisting of whole grains, vegetables, sea vegetables, mushrooms and fruits raw powder concentrate; very few data are available on GoJuvo® metabolic effects.**

## Subjects, Materials and Methods:

**1) Twenty overweight-obese subjects** (4M/16F, mean BMI 30.31± 5.58 kg/m<sup>2</sup>, aged 50.4±11.5), enrolled at the Obesity and Work outpatients Clinic of the Milano Policlinico Hospital, were evaluated for:

**Glycemic status (glycemia and insulinemia) and triglyceride concentrations** at:

**T0:** after overnight fasting

**T1a:** 2 hours after GoJuvo® administration (40 g in 300 ml of plain water)

**T1b:** 2 hours after a standard Mediterranean meal (60% carbohydrates, 25% lipids, 15% proteins)

**2) In 10 subjects** (2M/8F aged 54±8.4, mean BMI 30.52±6.39 kg/m<sup>2</sup>) **glycemic status, lipid panel** (total cholesterol, tChol; LDL cholesterol, LDL; HDL cholesterol, HDL; triglycerides, Trig) and **oxidative status** (ROS, TAC, oxLDL) were also evaluated three months after taking GoJuvo® as meal replacement (T2):

- 40 g of GoJuvo® as one meal replacement (for 4 weeks)
- 20 g of GoJuvo® as one meal replacement together with one portion of fruit and vegetables (for 8 weeks)

→ serum glycemia, insulinemia and lipid panel were assessed by using routine methods;

→ serum ROS concentrations and TAC were assessed by colorimetric methods (Diacron International, Italy)

→ serum oxLDL concentrations were assessed by ELISA method (Mercodia, Sweden)

## Aim

**To evaluate in overweight/obese subjects**

- 1) improvement, if any, in glycemic status and lipid panel due to GoJuvo® as compared to a standard Mediterranean meal.
- 2) changes in anthropometric and biochemical indexes after a three months GoJuvo® treatment.

## Results (1):

Data are expressed as mean±SD and, in brackets, mean delta values percentage of parameters' changes

\*  $p < 0.05$ , vs T1a

	T0	T1a	T1b
<b>glucose (mg/dL)</b>	91.6±9.2	87.0±10.7 (-4.3%)	94.9±23.1 (+4.4%) *
<b>insulin (mg/dL)</b>	10.6±7.1	11.0±13.4 (+2.1%)	49.0±60.9 (+306%) *
<b>triglycerides (mg/dL)</b>	96.8±8.1	89.9±36.1 (-5.8%)	119±48.8 (+37.6%) *

## Results (2):

Our preliminary data showed:

- **Mean percentage of weight loss: 6.63%**
- **Significant improvement in HDL cholesterol** (50±13.28 vs 58.28±13.57;  $p=0.01$ )
- **Significant decrease in triglycerides** (94.44±36.32 vs 76.28±16.12;  $p=0.01$ )
- **Decrease in glycemia even not significant so** (95,3±11.68 vs 89.43±8.94;  $p=0.16$ )
- No changes in insulin and other lipid panel parameters
- No changes in ROS, TAC and oxLDL concentrations

## Comments

1) Our data suggest that meal replacement metabolic modulations are better than post-prandium ones due to **60% integral rice** contained in 40 g of this natural vegetarian replacement raw meal, mixed with other fruits and vegetables.

2) The **prolonged use** of the natural vegetarian replacement raw meal seems to improve lipid panel and anthropometric indexes. **No changes in oxidative status were found**, especially in ROS concentrations, probably due to weight loss and fatty acid  $\beta$ -oxidation.