

For Immediate Release



## The 'Phosphorus Professor' holds a possible key to weight loss

Beirut, Lebanon- 12/2/2016- Research at the American University of Beirut is offering a possible solution to a worldwide obesity epidemic that uses a surprising weight loss aid: phosphorus. Further study is needed to clarify the exact mechanism by which this is achieved, but the findings so far are promising, according to Professor Omar Obeid who led the tests.

Obesity is recognized as a global health problem. Refined foods cause weight gain and chronic diseases. Meanwhile, high protein diets are associated with weight loss. But Professor Obeid at the department of Nutrition and Food Sciences at AUB's Faculty of Agricultural and Food Sciences (FAFS) and his team examined these three statements and asked:

- Is it really the lack of fiber in refined foods that leads to weight gain?
- What else may have been removed during the refinement process?
- Is it actually the proteins that result in weight loss?
- Could there be another component in high protein foods that is the real reason for weight control?

Dr. Obeid built on the scientific fact that certain minerals - especially phosphorus - are essential to metabolize carbohydrates. Cells trap glucose by binding it to phosphorus molecules, which decreases its level in the blood circulation. This leads to a lower insulin release and therefore a lower risk of diabetes. This entrapment of glucose leads to three desired results: 1) Glucose is taken out of the blood circulation, 2) Energy can be released by the breakdown of present glucose, 3) With the attainment of energy, the body no more feels the need for food intake and has reached a state of a suppressed appetite.

Glycolysis is part of cellular respiration, a series of reactions that break down glucose through oxidization, producing adenosine triphosphate (ATP) molecules. All organisms produce ATP by releasing energy stored in glucose and other sugars.

With ongoing tests and analyses, Professor Obeid developed his research in 2013 from the assumption that low phosphorus status is correlated to the onset of obesity, to being the cause of obesity, to more recently finding that, in fact, phosphorus intake during meals has the effect of lowering body weight, body mass index (BMI), waist circumference, and subjective appetite scores in overweight and obese adults.

Often referred to by his colleagues as the "Phosphorus Professor" for his enthusiasm for research in this area, Dr. Obeid conducted a study that analyzed data from 63 adults aged 45 years or younger with a Body Mass Index (BMI) of at least 25 kg/m<sup>2</sup> and normal kidney function. Participants were randomly assigned 375 mg phosphorus taken three times daily

with meals or a matching placebo for 12 weeks. The researchers requested that participants maintained their regular dietary and physical activity habits throughout the study period and to avoid alcohol and strenuous exercise 24 hours before study visits. Researchers measured body weight, lipid profiles, glucose, insulin and subjective appetite scores via a questionnaire at baseline, 6 weeks and 12 weeks.

The phosphorus group lost a mean of -0.65 kg; whereas the placebo group gained a mean of 1.13 kg. The phosphorus group also saw a modest reduction in BMI versus the placebo group (-0.24 kg/m<sup>2</sup> versus 0.42 kg/m<sup>2</sup>; P = .01) as well as a significant reduction in waist circumference (-3.62 cm versus 0.38 cm; P < .001).

The researchers found phosphorus supplementation had no effect on lipids profile. In addition to the results above, participants with Phosphorus intake reported significant reductions in appetite, quantity of food needed to reach fullness, and number of snacks consumed versus the placebo group.

#### **Further research needed**

Results obtained from this 12 week study suggested that supplementation halted weight gain and BMI while significantly decreasing waist circumference. These changes were also associated with early satiation.

“The findings from this study support a promising role of the mineral phosphorus in preventing obesity, especially abdominal adiposity. The study suggests that a higher intake of phosphorus, particularly during meals, could lead to controlled weight,” Dr. Obeid told us.

If such a simple solution to the challenge of keeping one’s weight down seems too good to be true, Dr Obeid cautions that his research is still in its early stages and more information must be gathered into the mechanism of the phosphorus supplementation.

“We need to better understand whether the observed body changes were related to reduced appetite and/or an increase in energy expenditure. We are currently looking at the postprandial energy expenditure resulting from the phosphorus manipulation of different meals. This would provide information on the effect of phosphorus on energy expenditure and on the source of energy utilized from carbohydrate or fat oxidation for example.”

While there are health risks connected to higher levels of phosphorus in the bloodstream, the human body does not store free phosphorus. If a person’s kidneys function properly, there is no concern about heightened levels. The phosphorus dosage administered in this study (375mg, 3 times daily) amounts to less than the maximum threshold allowed by the Dietary Reference Intakes reports (4000mg/day).

This research finding provides a new approach for the management and prevention of obesity, either through the adoption of diet that is high in phosphorus or the improvement of phosphorus content in stable food such as bread.

“This is an intriguing study which suggests that taking phosphorus supplements can suppress appetite and help people lose weight [...] It would be interesting to know whether these effects are maintained over a longer period,” Professor Peter Emery, Head of Department of Nutrition and Dietetics at Kings College London, told us.

#### **Innovative approaches**

Dr. Obeid's paper has already been featured in several journals, including Medscape, Nature.com, Endocrine Today, and Reuters' Medpage Today. Further research will clarify more definitively whether the resulting weight loss comes as a result of an increase in energy expenditure, rather than a decrease in food intake or a combination of both causes as currently believed by Dr. Obeid.

Dr. Omar Obeid has also recently won the CA and CC Rebeiz Award for Agricultural Research for the year 2014; an award that is dedicated for promoting agricultural research at AUB. His paper "Timing of caffeine ingestion alters postprandial metabolism in rats" published in Journal of Nutrition, was selected for this prize by the Constantine Rebeiz Committee.

The study demonstrated that caffeine administration seems to decrease insulin sensitivity as indicated by the sustenance of glucose status despite the presence of high insulin levels. The lower triglyceride levels in the presence of caffeine support the theory of retarded postprandial triglyceride absorption. Caffeine seems to play a biphasic role in glucose metabolism, as indicated by its ability to variably influence hepatic glycogen status.

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### **Note to Editors**

#### **About AUB**

Founded in 1866, the American University of Beirut bases its educational philosophy, standards, and practices on the American liberal arts model of higher education. A teaching-centered research university, AUB has more than 700 full-time faculty members and a student body of about 8,500 students. AUB currently offers more than 130 programs leading to bachelor's, master's, MD, and PhD degrees. It provides medical education and training to students from throughout the region at its Medical Center that includes a full-service 420-bed hospital.

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