

## **Parallel Session RTD Line 5 / Consumer Responses to Food Products**

### **Lecture 5: Perception, metabolism and body weight regulation: use of a bioactive mixture in negative energy balance**

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#### **Abstract**

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Adherence to weight-loss diets is difficult and uncomfortable. It is therefore of importance to design weight-loss diets that tackle undesirable physiological responses of the body.

In recent one-meal exposure studies we have shown effects of specific food ingredients (dietary protein, capsaicin, and resistant starch) on energy expenditure, satiety and appetite related hormones. Another food ingredient that may be an attractive tool in weight-management, because of its stimulating effects on thermogenesis and fat oxidation, is green tea.

Since the abovementioned food ingredients seem to have an effect on different mechanisms and pathways, it is of interest to study the synergistic effects of these food ingredients on energy expenditure, substrate oxidation, and satiety. Furthermore, we investigated whether an 80% energy requirement diet plus bioactive mixture reaches the same satiety and thermogenesis level as a 100% energy requirement diet without bioactive mixture.

Sixteen healthy normal-weight subjects were studied for 2 days in 4 conditions: 1) 100% energy requirement diet plus bioactive mixture (100%H); 2) 100% energy requirement diet, without bioactive mixture (100%C); 3) 80% energy requirement diet plus bioactive mixture (80%H); 4) 80% energy requirement diet, without bioactive mixture (80%C), while appetite profile and energy expenditure were continuously monitored.

Feelings of satiety were significantly higher in condition 80%H ( $1210 \pm 86 \text{ mm} \cdot 24 \text{ h}$ ) than in condition 100%C ( $1022 \pm 100 \text{ mm} \cdot 24 \text{ h}$ ,  $p < 0.02$ ). Total energy expenditure was significantly higher in condition 80%H ( $9.14 \pm 0.32 \text{ MJ/d}$ ) than in condition 100%C ( $8.90 \pm 0.29 \text{ MJ/d}$ ,  $p < 0.02$ ). Fat balance in condition 80%H ( $-20 \pm 5 \text{ g/d}$ ) was significantly different from fat balance in condition 100%C ( $16 \pm 4 \text{ g/d}$ ,  $p < 0.001$ ). Carbohydrate balance was significantly different in condition 80%H ( $-43 \pm 9 \text{ g/d}$ ) from carbohydrate balance in condition 100%C ( $25 \pm 7 \text{ g/d}$ ,  $p < 0.001$ ). Protein balance was not different between condition 80%H ( $-1 \pm 7 \text{ g/d}$ ) and condition 100%C ( $-1 \pm 2 \text{ g/d}$ ).

A combination of bioactive components added to a 20% energy restricted diet results in higher EE and satiety compared to a control diet in energy balance. A combination of bioactive components may facilitate adherence to a energy deficit diet by sustaining satiety and energy expenditure.