

# THE TYPE OF DIETARY FAT INFLUENCES THE INSULIN RESISTANCE, BUT DOES NOT ALTER BODY WEIGHT IN MORBIDLY OBESITY WOMEN WITH THE GENOTYPE PRO12PRO IN *PPAR GAMMA 2*

Kaippert VC<sup>1</sup>, Rosado EL<sup>1</sup>, Lago MF<sup>1</sup>, Uehara SK<sup>1</sup>, D'Andrea CL<sup>1</sup>, Nogueira J<sup>1</sup>, Oliveira EMM<sup>2</sup>

<sup>1</sup>Universidade Federal do Rio de Janeiro, <sup>2</sup>Embrapa Agroindústria de Alimentos – Brasil

## INTRODUCTION

Obesity is a multifactorial disease that predisposes to the development of other chronic non-communicable diseases. The insulin resistance (IR) associated with excess body weight is the main factor responsible for the complications of obesity.

Among the etiologic factors associated with the obesity, the dietary fats are important due to higher energy density, less satiating effect, low priority oxidative and regulate the expression of genes associated with lipid and glucose metabolism, as the peroxisome proliferator-activated receptor gamma 2 (*PPAR gamma 2*).

This transcription factor is associated with reactions of adipogenesis and insulin sensitivity. The polyunsaturated fatty acids (PUFAs) are considered important agonists of this gene that can help in reducing the IR.

The aim of this study was to evaluate the effect of high PUFA diet on body weight loss and IR in morbidly obesity women with the *PPAR gamma 2* Pro12Pro genotype.

## SUBJECTS AND METHODS

Were evaluated 18 adult women with body mass index (BMI) equal to or greater than 40 kg/m<sup>2</sup> genotyped for *PPAR gamma 2* by polymerase chain reaction - restriction fragment-length polymorphism (PCR-RFLP).

The women were divided in two groups and submitted to the test diet for 45 days: Group 1 (G1) with 10-15% of total energy expenditure (TEE) of PUFA and up to 10% of monounsaturated fatty acids (MUFA) (n=08); and group 2 (G2 - control) with up to 10% of TEE of PUFA and 10-15% of MUFA (n=10). The saturated fatty acids were similar in G1 and G2 (7-8% of TEE).

Were performed fasting biochemical analysis (plasma glucose and serum insulin) and anthropometric (body weight, height and waist circumference (WC)) before and after the dietary intervention.

It was used HOMA-IR (Homeostasis Model Assessment) for evaluation of the IR (HOMA equal to or greater than 2.71).

The data were analyzed in the statistical program SPSS® version 11.0, considering  $p < 0.05$ .

## RESULTS AND DISCUSSION

In PCR-RFLP were generated fragments with 267 bp (base pairs), characterizing the genotype Pro12Pro.

The anthropometric and biochemical characteristics before dietary intervention are presented in Table 1, with no difference between the groups ( $p > 0.05$ ). All volunteers showed excess abdominal adiposity, represented by WC above 80 cm.

Weight loss did not differ between groups (2.67 ± 1.47 kg and 2.68 ± 1.58 kg in G1 and G2, respectively).

The anthropometric variables did not differ after the intervention in both groups (Table 2 and 3). There was reduction of plasma glucose, serum insulin and HOMA-IR in G2 (Table 3).

## CONCLUSION

The type of dietary fat did not influence the body weight loss. MUFA intake improved glucose metabolism, which did not occur with the PUFA intake.

**Table 1:** Age, anthropometric and biochemical variables (mean ± standard deviation) by groups, before dietary intervention.

Groups	Test group (G1) (n=08)	Control group (G2) (n=10)	P
Age (years)	35.6 ± 6.4	37.6 ± 5.6	0.51
BMI <sup>1</sup> (kg/m <sup>2</sup> )	44.2 ± 2.7	44.6 ± 3.6	0.80
WC <sup>2</sup> (cm)	122.8 ± 7.6	125.7 ± 10.0	0.52
Glucose (mg/dL)	86.0 ± 9.4	103.9 ± 27.3	0.09
Insulin (μU/mL)	11.0 ± 3.6	15.9 ± 7.8	0.13
HOMA-IR <sup>3</sup>	2.4 ± 0.9	4.2 ± 2.5	0.06

<sup>1</sup> Body mass index; <sup>2</sup> waist circumference; <sup>3</sup> Homeostasis Model Assessment.

**Table 2:** Anthropometric and biochemical variables (mean ± standard deviation), before and after dietary intervention, in G1.

Variables	Before	After
BMI <sup>1</sup> (kg/m <sup>2</sup> )	44.2 ± 2.8 a	43.1 ± 2.9 a
WC <sup>2</sup> (cm)	122.8 ± 7.6 a	119.2 ± 7.8 a
Glucose (mg/dL)	86.0 ± 9.4 a	86.4 ± 7.3 a
Insulin (μU/mL)	11.0 ± 3.6 a	9.3 ± 4.8 a
HOMA-IR <sup>3</sup>	2.4 ± 0.9 a	2.0 ± 1.0 a

<sup>1</sup> Body mass index; <sup>2</sup> waist circumference; <sup>3</sup> Homeostasis Model Assessment. Means followed by same letter do not differ in the level of 5% probability by t test.

**Table 3:** Anthropometric and biochemical variables (mean ± standard deviation), before and after dietary intervention, in G2.

Variables	Before	After
BMI <sup>1</sup> (kg/m <sup>2</sup> )	44.6 ± 3.6 a	43.6 ± 3.7 a
WC <sup>2</sup> (cm)	125.8 ± 10.0 a	122.8 ± 10.9 a
Glucose (mg/dL)	103.9 ± 27.3 a	91.7 ± 19.0 b
Insulin (μU/mL)	15.9 ± 7.8 a	8.0 ± 2.2 b
HOMA-IR <sup>3</sup>	4.2 ± 2.4 a	1.8 ± 0.5 b

<sup>1</sup> Body mass index; <sup>2</sup> waist circumference; <sup>3</sup> Homeostasis Model Assessment. Means followed by different letters differ at 5% probability by t test.

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