Introduction
It is well known that elevated blood cholesterol is an important modifiable risk factor in the development of coronary heart disease. TOTUM•070 is a clinical stage polyphenol-rich active substance composed by the association of 5 plant extracts developed to help in the management cholesterol level. We assessed the hypothesis that administration of T070 prevents hypercholesterolemia in western diet fed mice.

Mouse study design
Eight weeks-old male C57BL/6JOaHsd mice were fed low fat diet (LFD), 10 Kcal% Fat (Research Diets D14042701) or Western Diet (WD), 41 Kcal% Fat, 30 Kcal% Sucrose and 0.2 g/mg cholesterol (Research Diets D12079B) for 6 weeks. On the first day of the study, mice in LFD group (n=14) were gavaged daily with vehicle Tween 1% solution at 10 µl/g body weight. Mice fed with WD received a daily gavage of either vehicle (n=14), or 2 different solutions of TOTUM•070 at 1 g/kg body weight(n=14) or at 3 g/kg body weight (n=14). Blood was collected at the tail vein at week 0 and after 3 weeks and 6 weeks of the study to measure plasma total cholesterol. Whole body composition was determined with Zinsser Analytic Echo MRI analysis. Lipid extraction and quantification was performed in feces were collected for 7 days during the week 5 of the study. Gene expression was performed on liver and intestine collected at the end of the 6-weeks study. Liver triglycerides content was also analyzed.

Results
Mice gavaged with TOTUM•070 at 3g/kg showed reduction of body weight gain during the study compared to WD-fed mice. At the end of the study, 3g/kg TOTUM•070 significantly lowered fat mass in comparison to the WD group.

Liver triglycerides (mg/dl per 100mg liver) * : different from LFD $ : different from WD Hepatic gene expression * : different from LFD $ : different from WD Hepatic steatosis is decreased with TOTUM•070 in a dose dependent manner. Expression of genes implicated in cholesterol metabolism and lipoprotein synthesis were altered with the western Diet in both the liver and the jejunum. TOTUM•070 supplementation showed differential regulation on selected genes.

Conclusion
TOTUM•070 prevented development of hypercholesterolemia in mice fed with a Western Diet together with reduction of hepatic steatosis. This study highlights the interest of TOTUM•070 in the management of hypercholesterolemia.