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Use of *Moringa Oleifera* in the Reduction of the Blood Cholesterol Level

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Food Products and Fat

- ❑ Public dietary recommendations argued the intake of nutrients with low total fat specifically cholesterol, saturated fat and trans fat-intake
- ❑ Saturated fat intake is linked with risk of the accelerated development of artery disease and mortality from heart attack and stroke
- ❑ Dairy fat consumption was thought to cause cardiovascular diseases because of the increase of saturated fats specifically cholesterol
- ❑ Individual fatty acids were mostly saturated, with the exception of stearic and some short-chain fatty acids, which raise LDL significantly
- ❑ Bovine milk contains about 33 g total lipid (fat) per liter
- ❑ Triacylglycerols account for about 95% of the lipid fraction
- ❑ Other milk lipids are diacylglycerol (2%), cholesterol (0.5%), phospholipids (1%) and free fatty acids (0.5% of total milk lipids)

The Bad Cholesterol

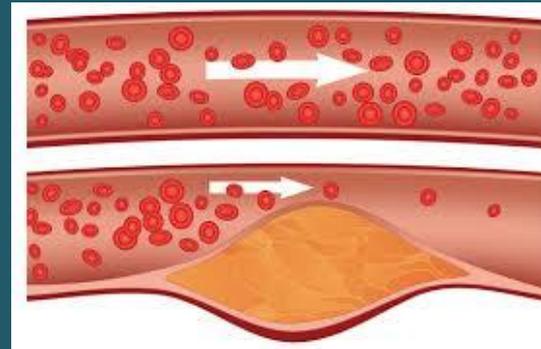
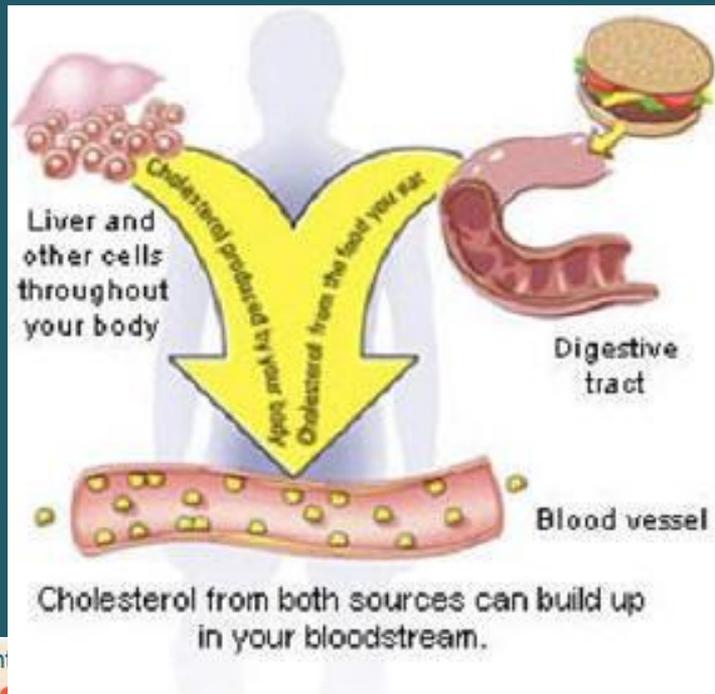


Cholesterol
Cholesterol is a waxy fat carried through the bloodstream by lipoproteins.

HDL
High-density lipoproteins
"Good cholesterol"

LDL
Low-density lipoproteins
"Bad cholesterol"

"Good" cholesterol (HDL) is stable and carries "bad" cholesterol (LDL) away from the arteries. "Bad" cholesterol (LDL) sticks to artery walls and contributes to plaque build-up.

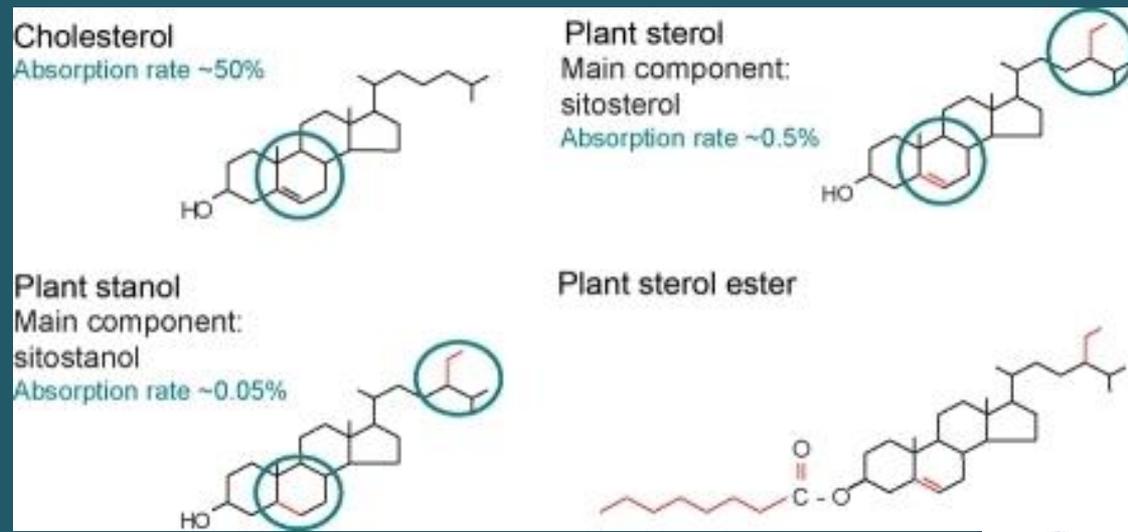


Cardiovascular diseases and strokes

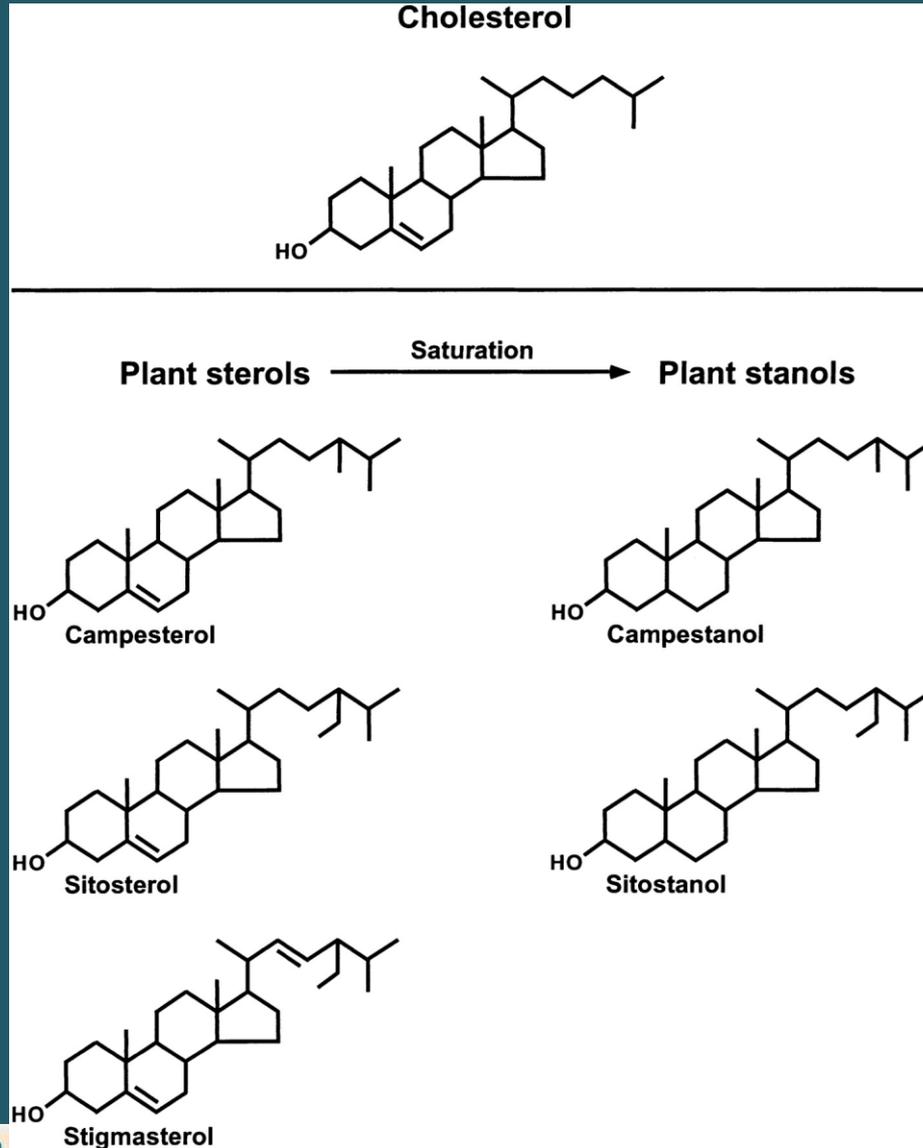


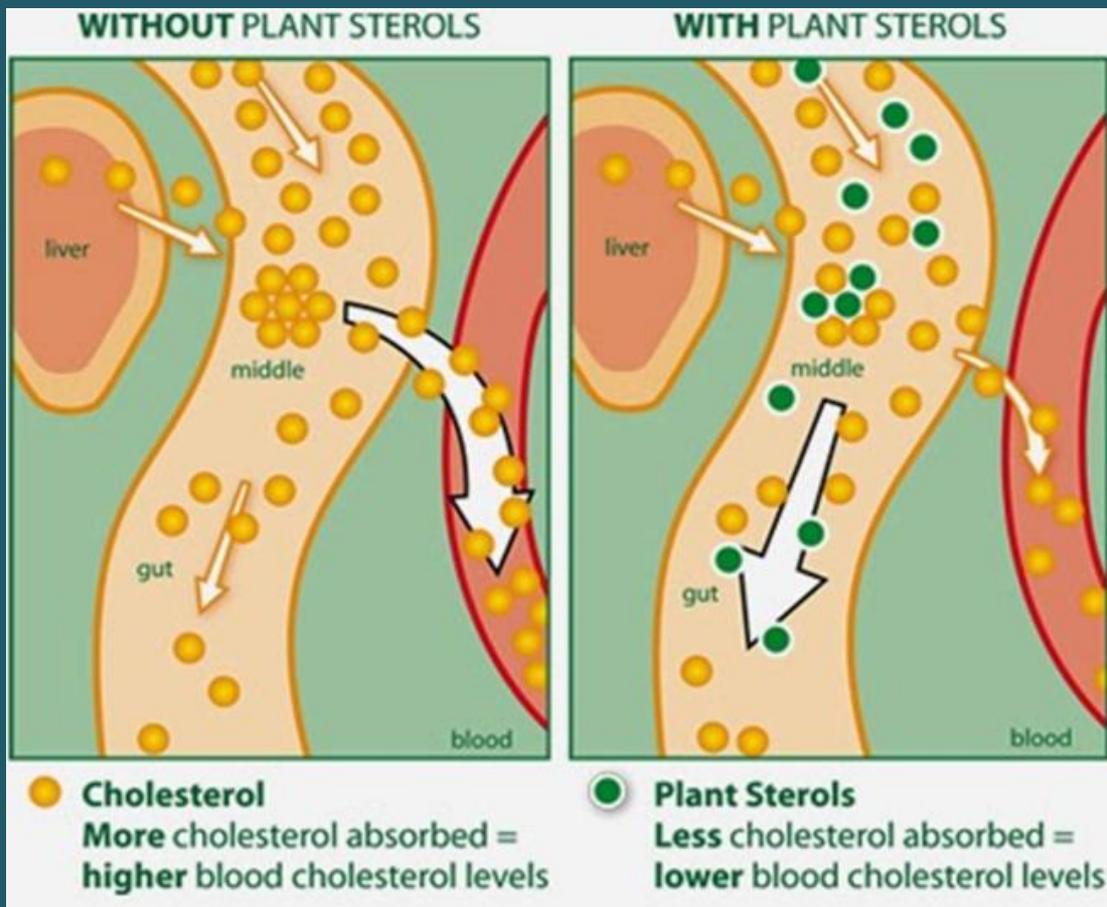
Plants and Cholesterol

- ❑ Plant sterols reduce serum cholesterol, mainly LDL cholesterol, by inhibiting cholesterol absorption in the small intestine
- ❑ Plant sterols displace cholesterol in the micelles in the intestinal lumen, thus inhibiting the absorption of both dietary and biliary cholesterol
- ❑ They are structurally similar to cholesterol, differing only in the side chain substitution
- ❑ Plant stanols are saturated derivatives of sterols. They are almost unabsorbable and therefore can be considered as a safe dietary treatment for hypercholesterolaemia



Plants and Cholesterol





therowanclinic.blogspot.com

Moringa olifera

Baisedosterol
Methylate cholesterol
Campesterol
Stigmasterol
Egasterol
Clerosterol
B-Sisterol
Etc..

Moringa olifera (Horseradish, Drumstick)

sources: treesforlife.org, International Research Journal Of Pharmacy Vol. 3, Iss. 6, 06/2012

v1.1 - 09/2012 - pierre jdf

location

grows quickly & easily in tropical / sub-tropical climate



Fidel Castro Ruz
Cuba - June 17, 2012

origin: Himalaya

« let's start mass production ! »



flower



leaves

fresh
dry



Pods (drumsticks)



seeds

can replace alumin sulfate
to purify water



oil

cooking
cosmetics



roots

aka: ben - benzoin



pharmacology

the following has been scientifically proven
more numerous positive effects are still under research

anti asthmatic
anti inflammatory
anti oxydant
anti microbial
anti cancer
anti diabetic

hypotensive
hepatoprotective
anti epileptic
anti urolithiatic
diuretic
...

nutrition

overcome malnutrition, especially for infants / nursing mothers
more vitamins, minerals & proteins than most of vegetables
dry leaves content comparison :

calcium	4 x	milk
magnesium	36 x	egg
potassium	3 x	banana
iron	25 x	spinach
protein	2 x	milk
polyphenol	8 x	red wine
amino acid	2 x	black vinegar
R-amino acid	4 x	gaba tea
chlorophyll	4 x	wheat grass
vitamin A	4 x	carrot
C	7 x	orange
B	4 x	porc meat
B ₂	50 x	sardine
B ₃	50 x	peanut
E	3 x	almonds

aka - nbédaye ...

Moringa olifera Distribution



Study Design & Methodology



Group 1:
Moringa + Food



Group 2:
Moringa + Food + Bovine Fat



Group 3:
Food + Bovine Fat

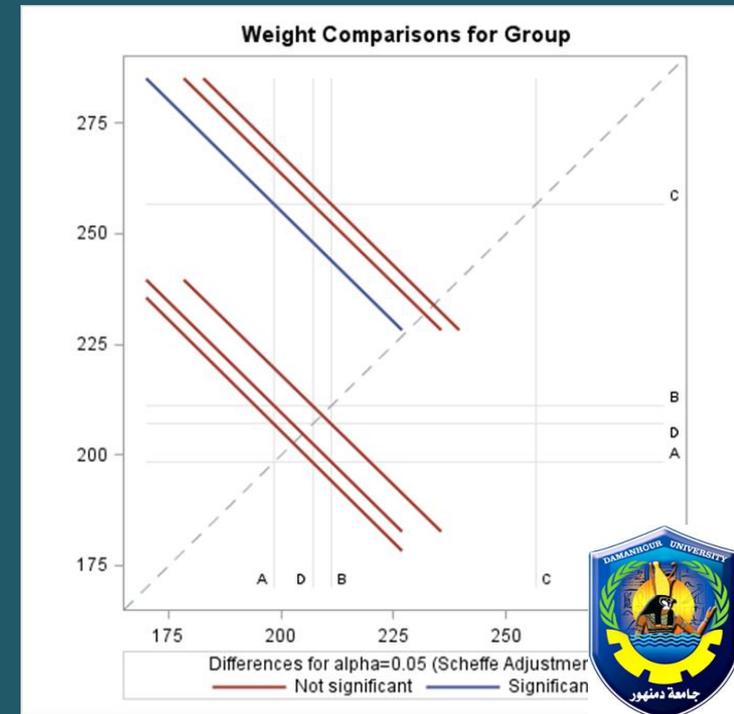
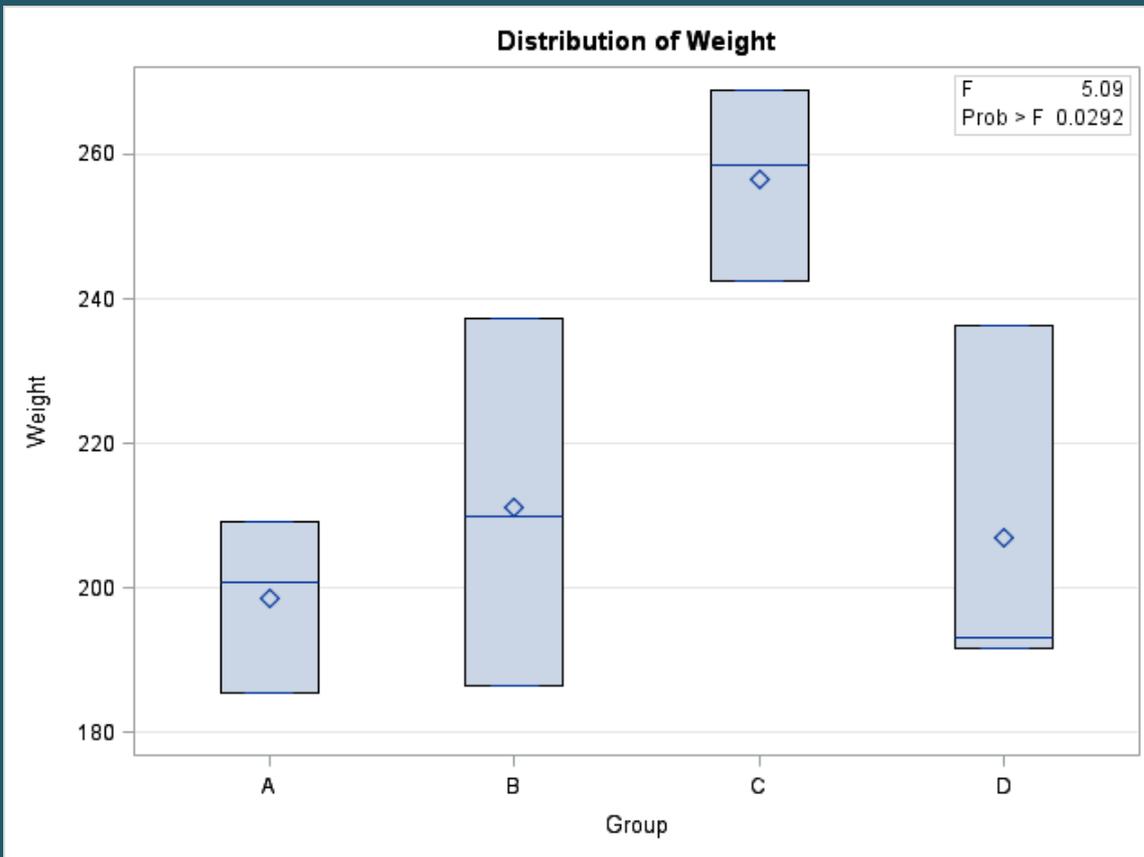


Group 4:
Food

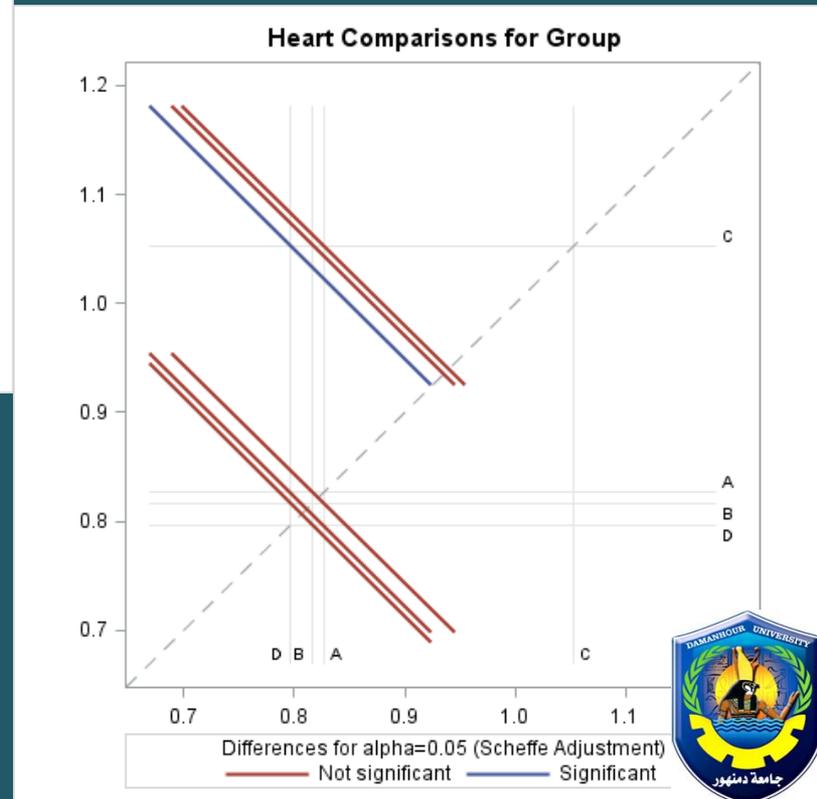
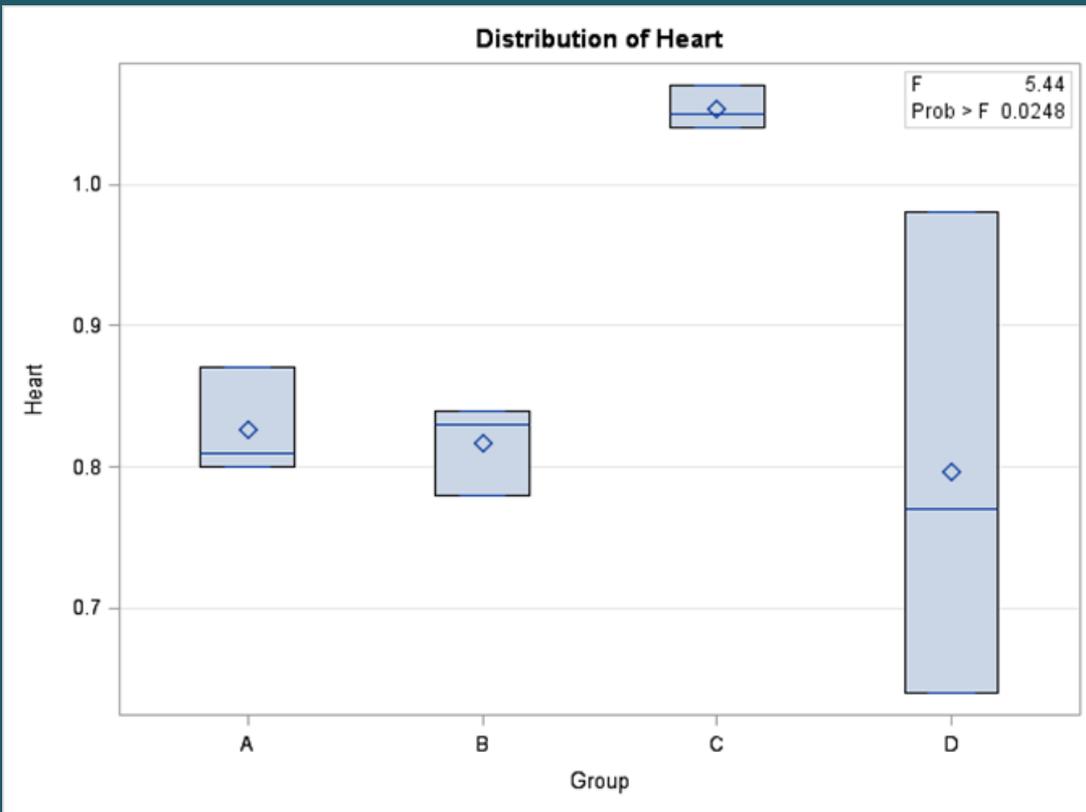
Rats were housed for 45 days and weighed daily then blood samples were collected for different biochemical assays including cholesterol

Summary of Results

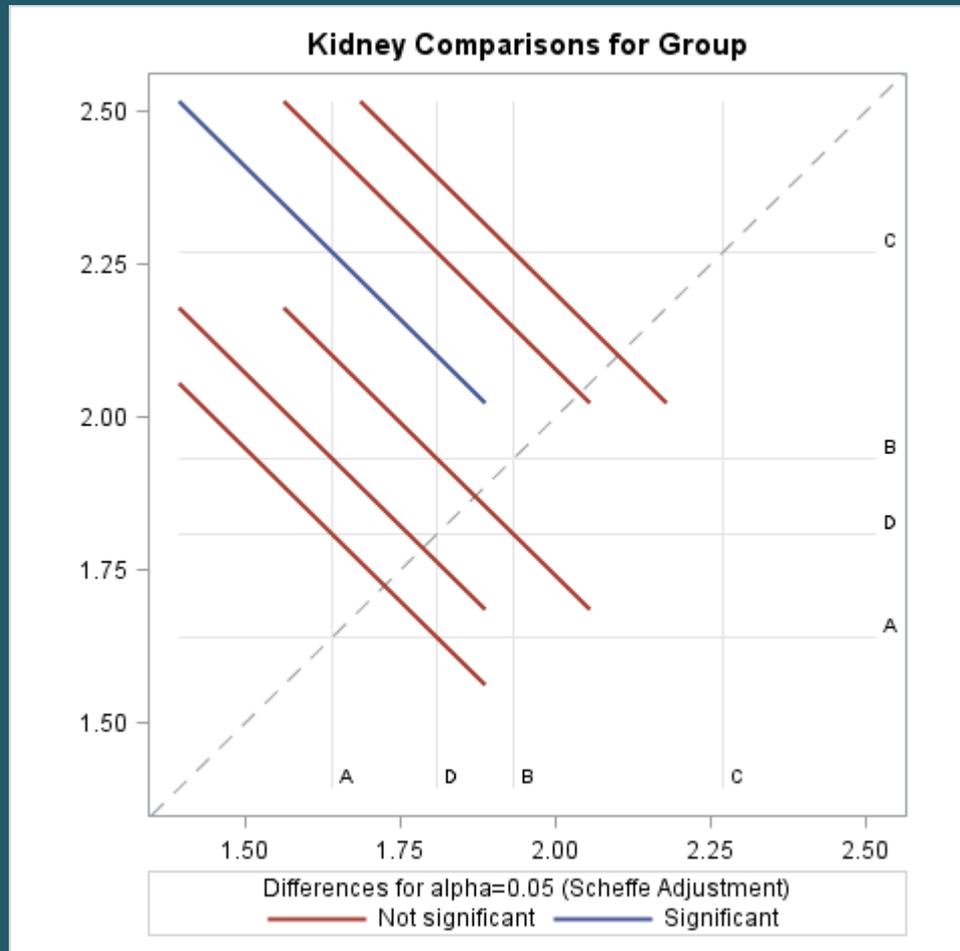
Total weight of rats at the end of the experiment (45 d)



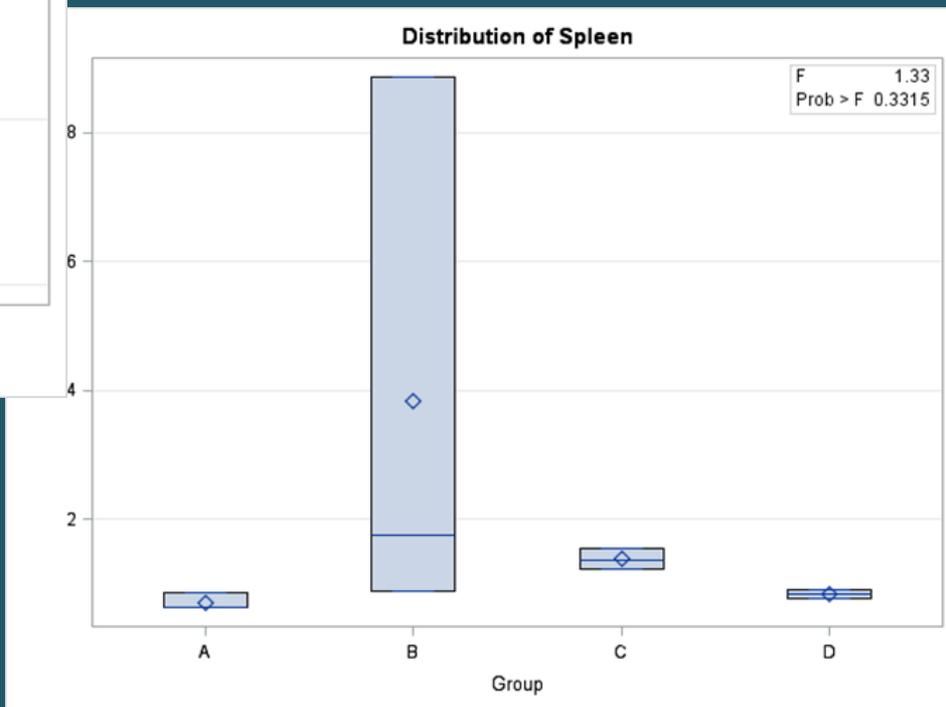
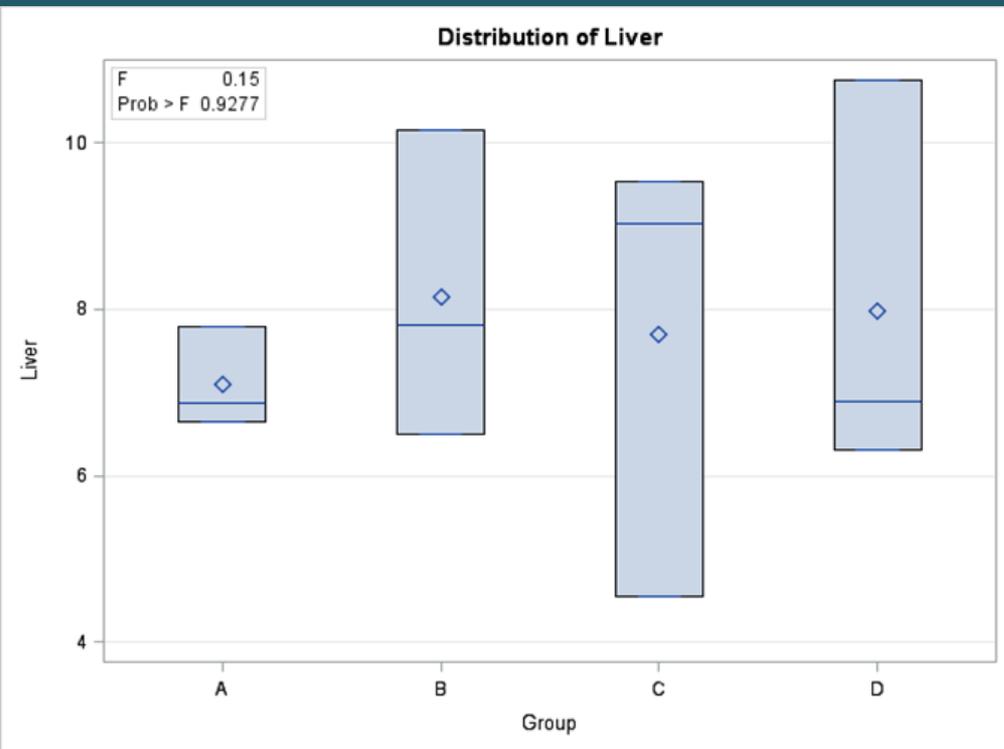
Weight of heart of rats at the end of the experiment (45 d)



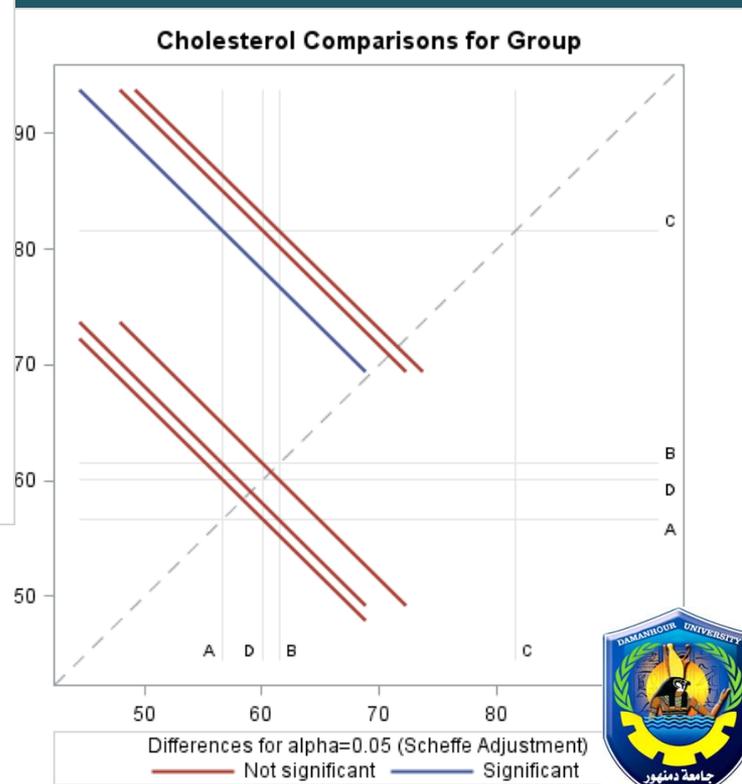
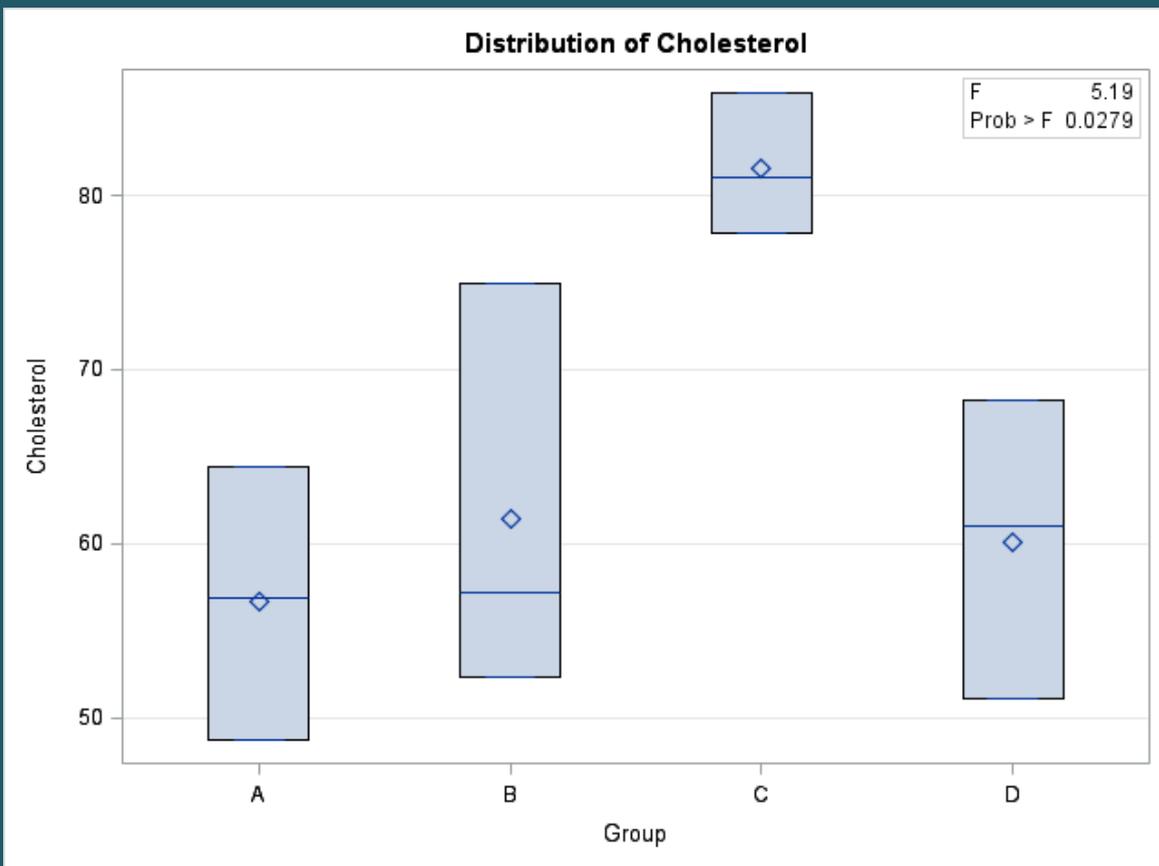
Weight of kidney of rats at the end of the experiment (45 d)



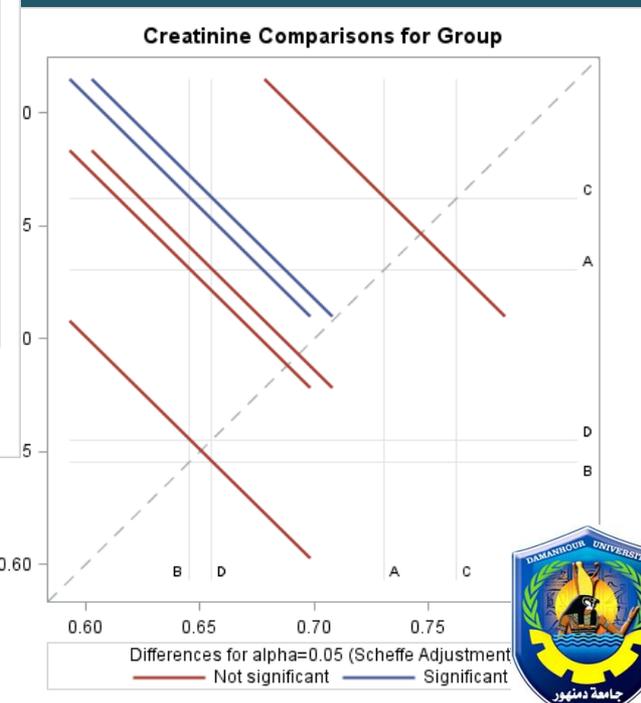
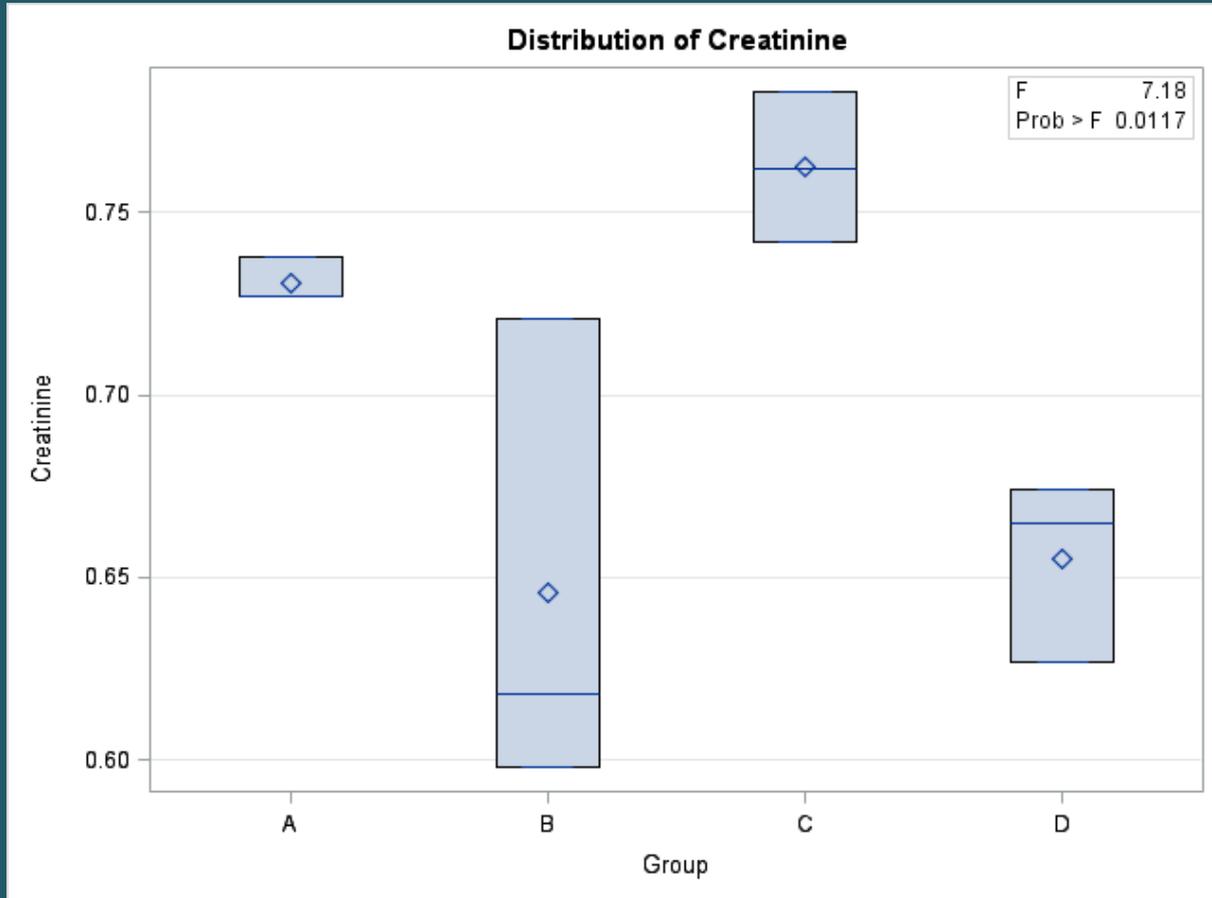
Weight of liver and spleen of rats at the end of the experiment (45 d)



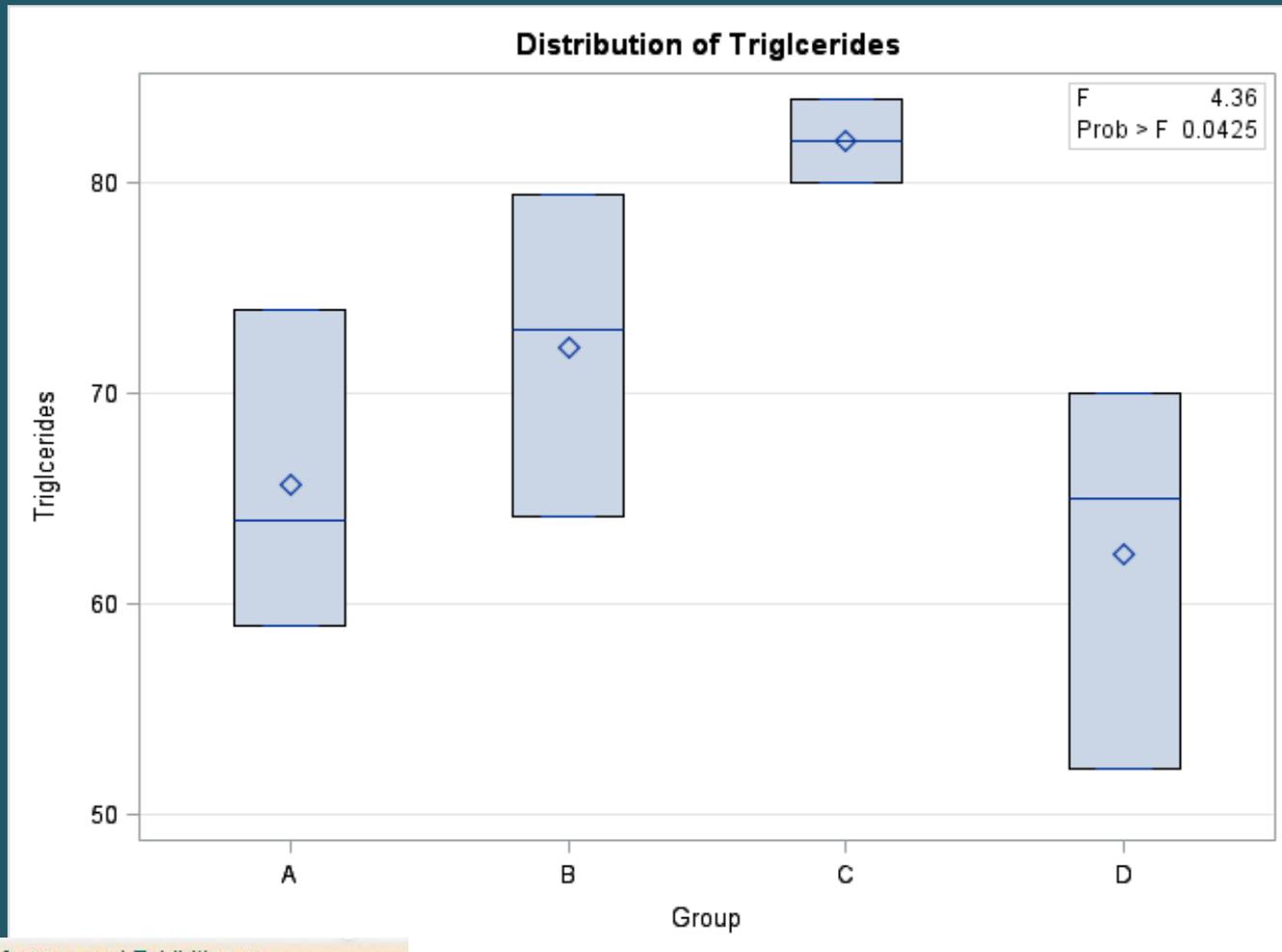
Cholesterol content (mgdl⁻¹) of serum samples of rats at the end of the experiment (45 d)



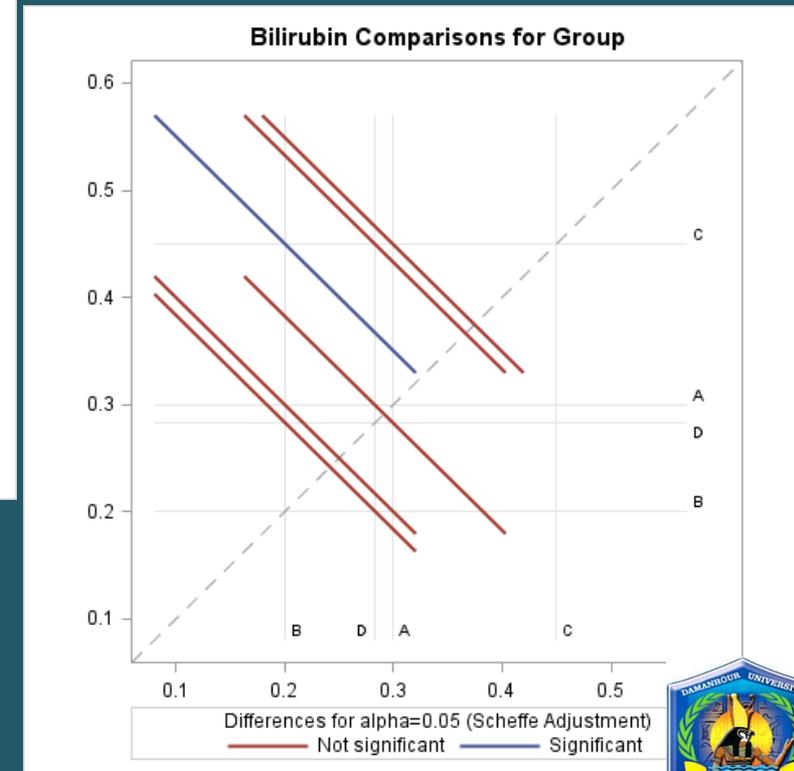
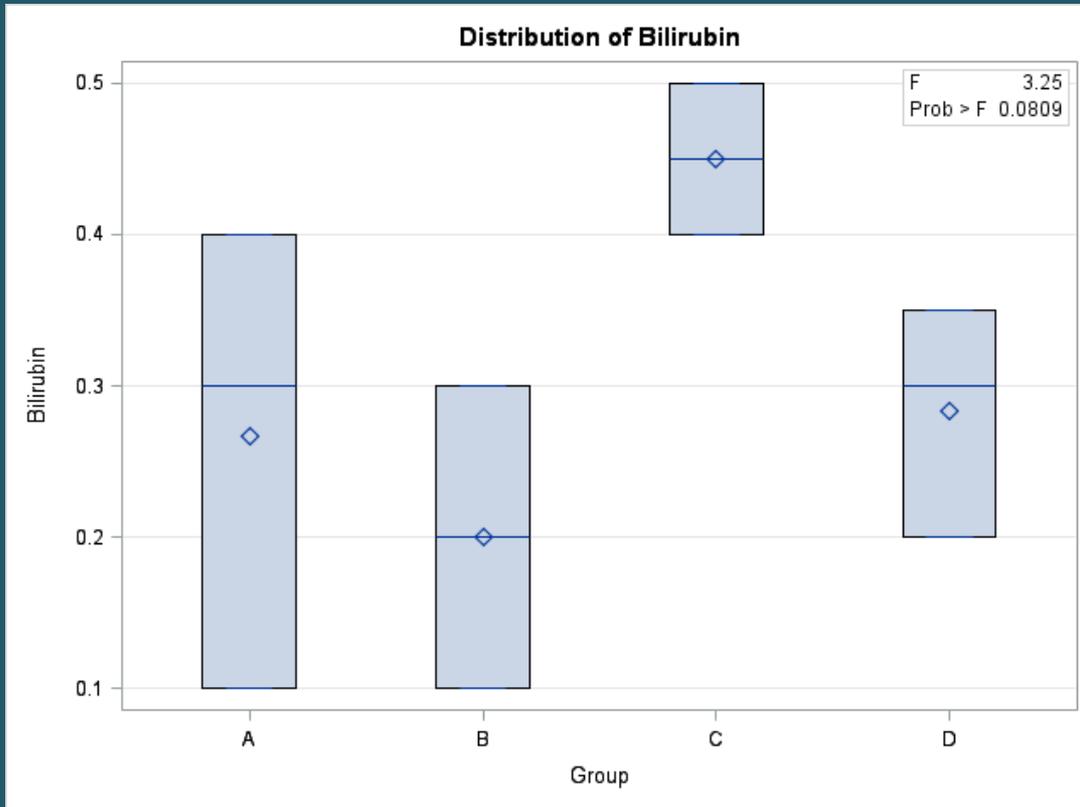
Creatinine content (mgdl⁻¹) of serum samples of rats at the end of the experiment (45 d)



Triglycerides content (mgdl⁻¹) of serum samples of rats at the end of the experiment (45 d)



Bilirubin content (mgdl⁻¹) of serum samples of rats at the end of the experiment (45 d)



Conclusions

- ❑ Rats fed fat-rich food had increased total weight, heart, and kidney compared with other groups
- ❑ Serum content of cholesterol, bilirubin, creatinine, and triglycerides of serum samples of rats fed fat-rich food were significantly greater than control and Moringa-fed rats
- ❑ Rats fed Moringa mixed with feed either alone or mixed with fat had similar content of cholesterol, bilirubin, creatinine, and triglycerides to control

Thank You!

Questions?