Cite this as: Cun-xi NIE, Wen-ju ZHANG, Yong-qiang WANG, Yan-feng LIU, Wen-xia GE, Jian-cheng LIU, 2015. Tissue lipid metabolism and hepatic metabolomic profiling in response to supplementation of fermented cottonseed meal in the diets of broiler chickens. *Journal of Zhejiang University-Science B (Biomedicine & Biotechnology)*, 16(6):447-455. [doi:10.1631/jzus.B1400255]

Tissue lipid metabolism and hepatic metabolomic profiling in response to supplementation of fermented cottonseed meal in the diets of broiler chickens

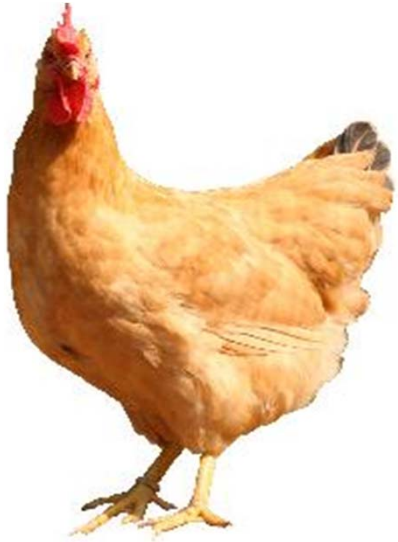
Key words: **Fermented cottonseed meal, Lipid metabolism, Broiler, Gene expression, metabolomics**

Background

- Fermented cottonseed meal (FCSM) has good nutrition value and efficient utilization.
- Excess fat deposition of broilers is a waste for consumers or economic loss for producers.
- Fermented products can improve lipid profiles and decrease fat deposition.

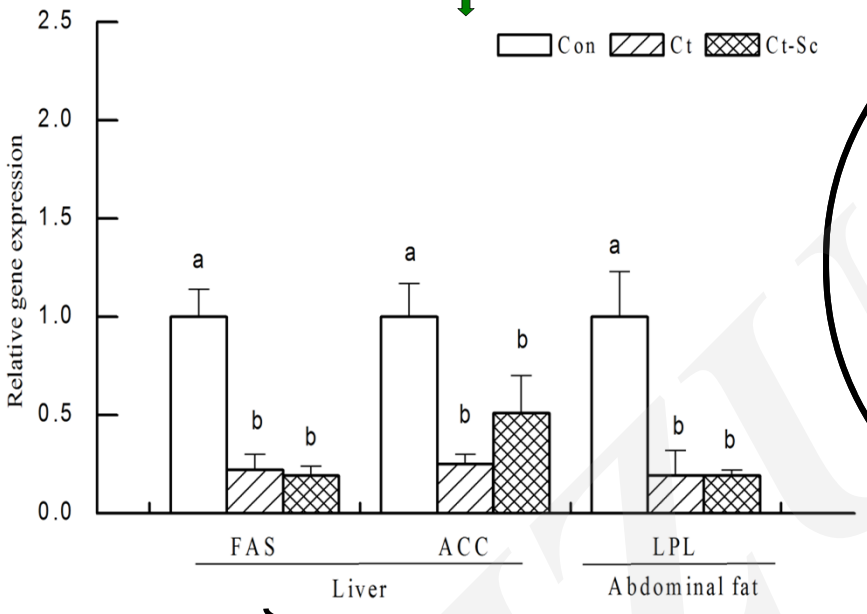
Purpose

- Effect of FCSM on lipid metabolism
- Its possible mechanisms



Main Results

Gene expression analysis



Metabolomics profiling analysis

Related Pathway

- TCA cycle (e.g. Citric acid)
- Fatty acid synthesis (e.g. Arachidonic acid)
- Glycerolipid metabolism (e. g. Ethanolamine)
- Amino acids metabolism (e.g. Glutamine)

Liver triglyceride

Abdominal fat

Con:control group; Ct and Ct-Sc: treatment group.

FAS: fatty acid synthase; LPL: lipoprotein lipase; ACC: acetyl CoA carboxylase.

Main conclusion

- **Dietary FCSM supplementation reduced the levels of liver triglyceride and abdominal fat.**
- **The regulation of lipid metabolism by FCSM was a complex process involving multiple gene expression and metabolism pathways.**
- **The present study demonstrated the great potential of nutrimetabolomics in researching complex nutrients added to animal diets.**