

# Feeding polyunsaturated fatty acids to inhibit lipid synthesis transcription factors in porcine liver

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Lipid synthesis or breakdown in the liver is under the control of transcription factors which can respond to different types of fatty acids in the diet. These factors were examined in pigs fed diets high in either, saturated fats (tallow) or polyunsaturated fats (flax or conjugated linoleic acid). Peroxisome proliferator activated receptor-alpha (PPARs) are transcription factors which respond to polyunsaturated fatty acids (PUFAs) to increase fat breakdown in the liver. The liver orphan receptor (LxR) transcription factor is believed to be increased by oxidized saturated fats to increase fat synthesis. The tallow supplemented pigs typically had higher levels of backfat. Pigs fed diets supplemented with 5% saturated fat (tallow) consistently had >2-fold higher levels of LxR gene expression than when fed the PUFA supplemented diets (flax, canola, CLA). Pigs fed the PUFA supplemented diets had higher transcription levels of lipid breakdown genes such as acyl Co A oxidase.

## **Implications:**

The LxR gene is located within a region of the pig genome known to affect carcass fatness levels. These data support the hypothesis that minor mutations in the pig LxR gene may be used as a genetic marker to identify pigs with leaner carcasses.