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**Citation for published version (APA):**

Janssens, S. M. M., Jonkers, R. A. M., Riel, van, N. A. W., Nicolay, K., & Prompers, J. J. (2012). In vivo magnetic resonance spectroscopy of lipid handling in steatotic rat liver. In *Experimental Biology 2012 : San Diego, April 21-25, 2012* (pp. 242.7-). (FASEB Journal : The Journal of the Federation of American Societies for Experimental Biology; Vol. 26).

**Document status and date:**

Published: 01/01/2012

**Document Version:**

Publisher's PDF, also known as Version of Record (includes final page, issue and volume numbers)

**Please check the document version of this publication:**

- A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
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- The final published version features the final layout of the paper including the volume, issue and page numbers.

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(The FASEB Journal. 2012;26:242.7)  
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242.7

## **In vivo magnetic resonance spectroscopy of lipid handling in steatotic rat liver**

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**Objective:** Examine lipid handling in liver of rats fed with different high-fat diets using  $^1\text{H}$ - $^{13}\text{C}$  magnetic resonance spectroscopy (MRS) together with oral administration of  $^{13}\text{C}$  labeled lipids.

**Methods:** 6 male Wistar rats (11 weeks old;  $348 \pm 8\text{g}$ ) were divided into three diet groups: low-fat (10% fat, CON), high-fat lard (45% fat, HFL), and high-fat palm oil (45%, HFP). After 10 weeks of diet, MRS experiments were performed at baseline, and 4 and 24 h after oral administration of 1.5 g [ $\text{U-}^{13}\text{C}$ ] Algal lipid mixture per kg body weight.

**Results:** At 4 h after administration of the  $^{13}\text{C}$  labeled lipids,  $^{13}\text{C}$  enrichment of intracellular liver lipids was similarly increased in all three groups compared to baseline (CON:  $0.031 \pm 0.017\%$ ; HFL:  $0.045 \pm 0.022\%$ ; HFP:  $0.033 \pm 0.013\%$ ), demonstrating that lipid uptake was not affected by the diet regimen. At 24 h, on the other hand,  $^{13}\text{C}$  enrichment of liver lipids decreased in CON, whereas in both high-fat diet groups the  $^{13}\text{C}$  enrichment did not change compared to 4 h, indicating a lower turnover of the stored liver lipids.

**Conclusion:** High-fat diet feeding did not alter liver lipid uptake in rats, but resulted in a decreased turnover of the lipids stored in the liver. *This research was funded by the Netherlands Consortium for Systems Biology (NCSB) which is part of the Netherlands Genomics Initiative/Netherlands Organisation for Scientific Research.*