



## Evaluation of inherent immunogenicity and allergenicity of camel and cow's milk products – a study using Brown Norway rats

Maryniak, Natalia Zofia; Hansen, Egon Bech; Sancho Vega, Ana Isabel; Mancino, Matteo; Lo, Li-Ping; Bøgh, Katrine Lindholm

*Publication date:*  
2019

*Document Version*  
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

*Citation (APA):*  
Maryniak, N. Z., Hansen, E. B., Sancho Vega, A. I., Mancino, M., Lo, L-P., & Bøgh, K. L. (2019). *Evaluation of inherent immunogenicity and allergenicity of camel and cow's milk products – a study using Brown Norway rats*. Abstract from 10th EAACI Pediatric Allergy and Asthma Meeting 2019, Florence, Italy.

---

### General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

## **Evaluation of inherent immunogenicity and allergenicity of camel and cow's milk products – a study using Brown Norway rats**

**Authors:** Maryniak, Natalia Zofia<sup>1</sup>; Hansen, Egon Bech<sup>1</sup>; Sancho Ana Isabel<sup>1</sup>; Mancino Matteo<sup>1</sup>; Lo, Li-Ping<sup>2</sup>; Bøgh, Katrine Lindholm<sup>1</sup>

<sup>1</sup>National Food Institute, Technical University of Denmark, Kgs. Lyngby, Denmark

<sup>2</sup>Ausnutria Dairy (China) Co., Ltd, Changsha, China

### **Background**

Cow's milk is the most common cause of food allergy among infants and children. However, it is also an essential source of nutrition when breastfeeding is impossible or insufficient. Alternatives to intact cow's milk products are available such as other mammalian-based milk products or hypoallergenic infant formulas. Camel milk has been suggested as an alternative to cow's milk products as camel milk proteins show a low cross-reactivity to their counterpart cow's milk proteins. Evaluating whether changes in camel milk protein structure caused by enzymatic hydrolysis (EH) or heat treatment (HT) can affect camel milk products as suitable alternatives to cow's milk-based products is of great interest.

### **Methods**

The aim of the study was to compare the inherent immunogenicity, allergenicity and cross-reactivity of different camel and cow's milk products. Brown Norway rats kept on a diet free from milk for more than 10 generations, were immunised i.p. three times with one of six products: camel or cow's milk, EH camel or cow's milk, or HT camel or cow's milk. Different ELISAs were used to assess the inherent immunogenicity, allergenicity as well as cross-reactivity and immunoblotting was performed in order to evaluate the specificity of antibody responses. Allergic reactions were studied by ear swelling test and symptom scoring.

### **Results**

Intact camel and cow's milk displayed similar immunogenicity and allergenicity. EH camel and cow's milk were both shown to be less immunogenic as well as allergenic than their parent product. The same was shown for HT cow's milk, whereas HT camel milk showed a higher immunogenicity and allergenicity. There was low cross-reactivity between intact counterpart proteins of camel and cow's milk, while greater cross-reactivity was shown between EH versions of camel and cow's milk indicating greater cross-reactivity between linear compared to conformational epitopes. The greatest cross-reactivity was seen between serum albumins (SA) from intact camel and cow's milk, a cross-reactivity retained after EH.

### **Conclusions**

Modification of camel and cow's milk affected their immunogenicity and allergenicity in different ways, which indicates differences in protein as well as matrix compositions of camel and cow's milk.