

Hamm R. Biochemistry of meat hydration. *Advan. Food Res.* 10:355-463, 1960.
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The principal factors affecting the immobilization of water in muscle tissue and their importance for the water-holding capacity (WHC) of meat and meat products are discussed. A review of our scientific knowledge on the implication of WHC in treatment and processing of meat is presented. [The SC][®] indicates that this paper has been cited in over 150 publications since 1960.]

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"The state of water in muscle is a fascinating field of research but is still a matter of controversy. There exists, however, well-founded knowledge on the factors which determine the extent to which bulk phase water is immobilized within the microstructure of the intact or comminuted tissue. This immobilization of water in the myofibrillar system determines for its part the water-holding capacity (WHC) of meat and its changes during storage and processing, as well as the quality of meat and meat products. An essential part of our knowledge in this field reported in the paper was based on research which was carried out in our laboratory in Kulmbach where I had started my work on WHC with Grau in 1952.

"When I wrote the review, I was able to interpret most WHC phenomena in meat and meat products in terms of interactions between adjacent protein molecules or myofilaments whereby attraction or repulsion between protein charges, interactions between

protein charges and inorganic ions as well as myosin-actin interactions play a dominant role. Surprisingly, this knowledge was gained by means of very simple methods, such as pressing the meat system between two plates (even today this procedure is still in general use) or by centrifuging it. Even if such techniques seemed to us quite primitive, they often gave—and still give—more useful information than more sophisticated methods. In the 1950s, almost every experiment confronted us with new exciting facts.

"The idea of a review on the biochemistry of meat hydration was born during my work on WHC in the laboratory of Fred E. Deatherage at the department of agricultural biochemistry of Ohio State University in Columbus (1958-1959). I am sure that Fred became aware of my papers published in German and invited me only because his co-worker, Eugen Wierbicki, was able to read German. Back home, I hastened to write the review. This article, as well as my stay in the US, opened the way for me into the international world of food science.

"I stopped any essential work on WHC of meat for about ten years because I was somewhat tired of this particular type of research. But for the past couple of years the work on WHC has been continued in our laboratory and is still as fascinating as it was in the beginning. Of course, after almost 25 years, some explanations and concepts given in my paper proved to be wrong or at least questionable. Nevertheless, many of them are still valid, and this might be one of the reasons the paper is cited so often. Another reason, I think, is simply the fact that a book on WHC of meat (with 1,250 references),¹ which I published 12 years later, is not known to many colleagues because it was written in German. Because of this language barrier, I am going to write a book in English. A rather comprehensive review which is mainly related to WHC of meat and meat products² will be published soon."

1. Hamm R. *Kolloidchemie des Fleisches*. Berlin: Parey Verlag, 1972. 275 p. (Cited 60 times.)

2. The functional properties of the myofibrillar system and its measurement. (Bechtel P J, ed.) *Muscle as a food*. New York: Academic Press. In preparation, 1984.