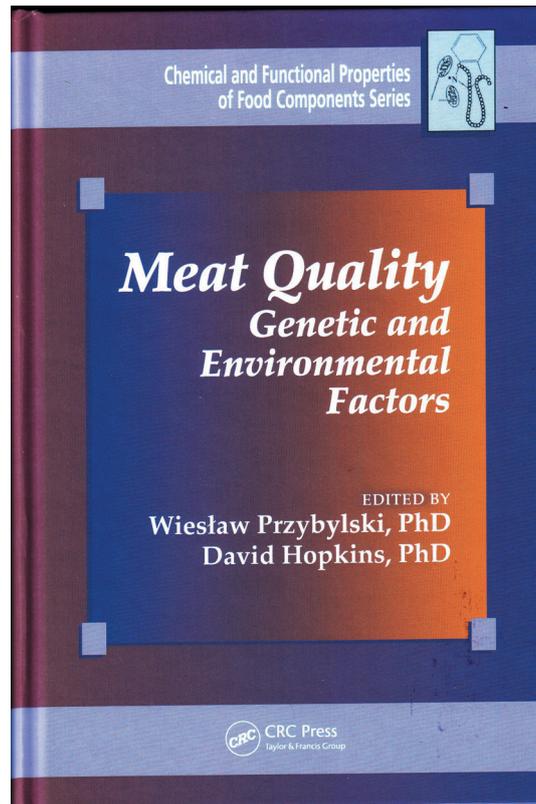


## BOOK REVIEW



### **Meat Quality - Genetic and Environmental Factors**

**Eds. Wiesław Przybylski & David Hopkins, CRC press, ISBN: 9781482220315. 472 pages, 51 B/W illustrations. Hardback £121.**

Recently, CRC Press in the series Chemical and Functional Properties of Food Components, editor Zdzisław E. Sikorski, published a book entitled: *Meat Quality-Genetic and Environmental Factors*, edited by Wiesław Przybylski and David Hopkins. The book was written by 39 academic teachers, researchers from research institutes and breeding companies, from: Australia, France, Ireland, Poland, Republic of China, Scotland, South Africa, the USA, and the United Kingdom.

The book, 472 pages, consists of the following chapters:

- Chapter 1.** Meat and muscle composition: Structure of muscle, Chemical and biochemical constitution of muscle, Nutritional value, Species and breed characteristics.
- Chapter 2.** Meat quality of slaughter animals.
- Chapter 3.** Conversion of muscle to meat.
- Chapter 4.** Impact of animal nutrition on muscle composition and meat quality.
- Chapter 5.** Terms of farming and animal welfare and meat quality.
- Chapter 6.** Preslaughter handling, welfare of animals, and meat quality.
- Chapter 7.** Stress reactivity, stress at slaughter, and meat quality.
- Chapter 8.** Slaughter-line operations and their effect on meat quality.
- Chapter 9.** Breeding strategies for improving meat quality.

- Chapter 10.** Influence of major genes on meat quality.
- Chapter 11.** Beef quality.
- Chapter 12.** Pork quality.
- Chapter 13.** Sheep quality: effect of breed, genetic type, gender, and age on meat quality.
- Chapter 14.** Transgenic animal technology and meat quality.
- Chapter 15.** Production of high quality of meat.

The book deserves great attention of academics, other researchers, university students studying food science and technology, and animal husbandry farmers, as well as, executive personnel of slaughterhouses and engineering staff of meat processing plants.

As can be noticed from the headings of the chapters, a very wide range of factors have impact on the culinary and processing characteristics of meat. Numerous biophysical, enzymatic, and chemical processes are presented and discussed by a team of highly qualified contributors. The book summarises the recent research findings on meat quality as influenced by: gender, race, rearing, fattening, age, applied technology of *post mortem* treatment, and processing.

Out of 15 chapters, as many as 13 are heavily overloaded with references, *e.g.* the references in chapter 4 occupies 13 pages with 256 citations, while references in Chapter 2 occupies 12 pages with 261 citations. Furthermore, in Chapter 3 printed on 12 pages about 11 references are cited per page.

On the other hand, no papers published in: French, German and Russian academic journals have been cited. It also does not seem justified to quote references being 40 and even over 50 years old, except for considering that some of them are the classic ones.

It is not possible to discuss in a review in details the contents of all chapters of the book.

Therefore the discussion below regards only the first chapters as examples. However, few remarks are also provided to the contents of **Chapter 14**, due to still existing controversy regarding that topic.

**Chapter 1** informs on muscle structure and composition, *i.e.* of muscle bundles, on diverse types of red and white fibres, on the "architecture" of muscle striated fibres, on the sarcomere unit structure, and on the filament, as well as on thick-myosin and thin-actin filaments and their contraction properties and function in the organisms.

The mechanism of pre-slaughter and *post-mortem* muscle contraction are described in details. The meat nutrition value and quality are also precisely pinpointed, as well as bioactive peptides, *i.e.* carnosine, glutathione, and antihypertensive peptides. Satisfactory information on macronutrients in meat and numerous criteria used for determination of meat protein quality are presented.

Information is provided on specific muscle proteins: myosin,  $\alpha$ -actinin, actin, troponin, tropomyosin, tropomodulin, nebulin, nebulin, titin, protein C, as well as on connective tissue proteins. The readers are informed on micronutrients, vitamins, and on a wide range of fatty acid residues of meat lipids.

In this chapter, overviews are also provided on meat originating from ruminants (ostriches, emus and rheas).

The content of the chapter is supported by 170 references.

**Chapter 2.** The authors concentrate the attention of potential readers on: visual and eating meat quality, on technological quality, as well as on microbiological meat quality in connection with spoilage resulting mainly from bacteria proliferation on the surface of meat and on pathogens related to aspects of meat safety.

Problems of so called defective meat and its definition are discussed. Defects could originate as consequence of management, environmental effects, and the conditions of production and processing applied.

Nowadays, established and well known defects of beef are described as the meat being DFD or partly DFD or PSE, while for pig meat recognized and presented are the following: RFN, PSE, RSE, PFN, PFE PFD, PSE, and ASE. Bruises and blood splashes also belong to meat defects. Methods of identifying faulty meat and quality standards in different species have been presented, as well as processing of faulty meat.

As far as meat sensory attributes are concerned, descriptors for analysis of odour attributes are as follows: heated meat aroma, sour, sharp, fatty and other and for texture attributes: tenderness, juiciness, chewiness, heated meat, sour, fatty, sweet, salty and overall quality.

Selected analytical methods such as: video image analyses, near-infrared spectroscopy, techniques using electromagnetic waves, instruments for measuring of: degree of fatness, meat tenderness, electric properties affected by impedance, resistance and conductivity, sensoric conductivity and invasive probe, pork quality meter, muscle stiffness and rigidity measured by muscle rigor meter and thoracic limb rigidity, various methods of water holding capacity determination such as filter paper wetness and percent drip loss, reflection caused by light scattering and reflection, fat-o-meter, Hennessy grading probe, pH determination by for example Ingold glass electrode and colour determination by Japanese colour standard, pork colour standards, Minolta portable chromameter, colorimeter probe, fiber optic probe, Hunter Labscan and temperature measurement using omega digital thermometer are presented. Quality categories are established which consist of: sensory, technological and nutritional quality, product safety and ethical consideration.

The content of chapter 2 is supported by 261 references.

**Chapter 3.** In this chapter attention of the readers is directed to chemical and physical changes in *post mortem* muscle tissue demonstrated by: decline of pH, heat dissipation of carcass temperature, *rigor mortis*, and disruption of muscle structure in which specific enzymes are involved such as for example: calpain system, calpastatin, cathepsins, and caspases, all of them, to a great extent, are associated with meat tenderization. In conversion of muscle tissue to meat changes in physical properties affected by *post mortem* glycolysis are observed. This results often in changes to PSE and/or DFD meat.

The content of the chapter is supported by 131 references.

**Chapter 14.** The editors of this book should be complimented for inclusion of chapter 14. In a concise manner the overview presents transgenic animal technology, its present stage of development, predicted future progress, and potential achievements to be aimed at to meet the growing global demand for animal protein. The readers are informed on progress and permanent improvement of techniques and technology for mammals, poultry, and fish in order to increase the muscle mass and growth, fat contents control in meat, and efficient, as much as possible, conversion of feedstuff. Present legal status and regulations with regard to production of transgenic animals are provided, mainly with regard to consumer acceptance and ethic aspects. It is predicted that contemporary success in transgenic fish production will be most probably in coming years a pavement for extending this technology for mammal and poultry.

The chapter is supported by 60 references.

To learn details regarding the contents of the remaining chapters the potential reader is encouraged to reach for the book.

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