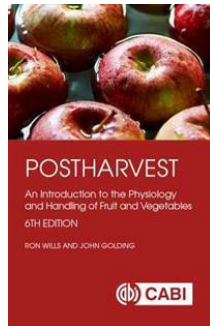


Course literature: Postharvest biology and technology 2025



Book: An introducing book will be used:

Postharvest - An Introduction to the Physiology and Handling of Fruit and Vegetables
av Ron B. H. Wills, John B. Golding, Ron B. H. Wills
pocket, 2016, ISBN 9781786391483 (marked in **yellow** below)

Other course literature:

Below you will find course literature connected to the different lectures in the course schedule. The list may seem long, but often there are selected pages to read in the reference given.

Introduction- basics about postharvest + senescence

Wills et al., 2016. Chapt 1:
Pp. 1-3+half of 4 only overview
Pp. 4, half -10
Pp. 10 (lowerheadline)-15 only overview

Kader, A. Increasing food availability by reducing postharvest losses of fresh produce. Proc.5th Int. Postharvest Symp., Acta Hort. 682, 2169-2175.: A., 2005.
[INCREASING FOOD AVAILABILITY BY REDUCING POSTHARVEST LOSSES OF FRESH PRODUCE | International Society for Horticultural Science \(ishs.org\)](#)

Lisa Kitinoja, and Adel A. Kader. 2015. Small-Scale Postharvest Handling Practices: A Manual for Horticultural Crops (5th Edition) :
[230094.pdf \(ucdavis.edu\)](#)
Pages 4-6, 10-11, 13, 37-38, 40, 194-197

Senescence

Hodges, D.M., 2003. Overview: Oxidative stress and postharvest produce. *In* Postharvest oxidative stress in horticultural crops. Hodges, D.M., ed.. Pp. 1-12 (distributed)

Note: The author uses "Active oxygen species" (AOS), where most others use "Reactive oxygen species" (ROS), but you can consider them as being the same.

On the first page, you do not have to understand the chemical background to the spin of the electrons of oxygen, but rather note that there are different forms of oxygen, and some are more reactive than

ground-state oxygen.

Mikal E. Saltveit. CHAPTER 4. Respiratory Metabolism. *In* Postharvest Physiology and Biochemistry of Fruits and Vegetables. Eds, Yahia & Carrillo-Lopez. Woodhead Publishing. Pages. 73-75 (to 4.2.2), 81-82 (4.4) + 85-86 (4.5.5) + 87-89 (4.6: 4.6.1; 4.6.2).

[Postharvest Physiology and Biochemistry of Fruits and Vegetables \(ufl.edu\)](#)

How does quality relate to chemical composition. Texture and taste

Wills et al, 2016. Chapt 2:

Page 16-19 to the headline

Page 19 from the headline -22 half Note – only if this is not familiar

Pp. 22-33

Chapter 2 (only 2.1 + 2.2) General properties of fruit and vegetables; chemical composition and nutritional aspects; structural features. *In* Fruit and vegetable processing. by Mircea Enachescu Dauthy. FAO AGRICULTURAL SERVICES BULLETIN No.119. Food and Agriculture Organization of the United Nations, Rome, 1995.

Chemical Composition of Vegetables and Their Products, 2015, by M. Butnariu and A. Butu. *In* Handbook of Food Chemistry. Read **Abstract + Introduction** parts (pp. 1-6)

https://www.researchgate.net/publication/302493121_Chemical_Composition_of_Vegetables_and_Their_Products - Sök på Google

Biochemical Basis for Functional Ingredient Design from Fruits; by Jacob et al. . Annu. Rev. Food Sci. Technol. 2012. 3:79–104. Read pages **79-87**, until Functional Properties...

[Biochemical Basis for Functional Ingredient Design from Fruits \(researchgate.net\)](#)

Texture.

[Chapter 14. Texture | Elsevier Enhanced Reader](#)

Plant Volatile Compounds: Sensory Cues for Health and Nutritional Value? S.A. Goff, H.J. Klee.

[Plant Volatile Compounds: Sensory Cues for Health and Nutritional Value? \(science.org\)](#)

Quality in relation to factors before harvest

Wills et al, 2016. Chapt.8: pp 153- 159, until the headline, pp.164, from the headline -169

Sams C.E, 1999. Preharvest factors affecting postharvest texture Postharvest Biology and Technology, 15, Issue 3, 249-254.

[Primo - SLU University Library - Postharvest biology and technology \(exlibrisgroup.com\)](#)

On this page, use the link “ScienceDirect”, and then go to the meny “Articles and Issues”, and look up the volume 15, issue 3, then the pages 249-254.

Weston L.A., Barth, M.M. Preharvest factors affecting quality of vegetables. HortSci, 32, 812-816, 1997.

<https://journals.ashs.org/hortsci/view/journals/hortsci/32/5/article-p812.xml>

Druege, U., 2001. Postharvest responses of different ornamental products to preharvest nitrogen supply: role of carbohydrates, photosynthesis and plant hormones. Acta Hort. 542, 97-105.

[POSTHARVEST RESPONSES OF DIFFERENT ORNAMENTAL PRODUCTS TO PREHARVEST NITROGEN SUPPLY: ROLE OF CARBOHYDRATES, PHOTOSYNTHESIS AND PLANT HORMONES. \(actahort.org\)](https://actahort.org/)

Food losses in relation to quality.

Jordbruksverket (Swedish Ministry of Agriculture) Marketing standards for fruits and vegetables

[Marketing standards for fruits and vegetables - Jordbruksverket](#)

[General marketing standard.pdf \(jordbruksverket.se\)](#)

UNECE standards (only to orientate about which there are):

[Fresh Fruit and Vegetables - Standards | UNECE](#)

Please look at the standard for carrots as an example (only as an example, not to learn the details):

[Microsoft Word - 10Carrots_2017_e \(unece.org\)](#)

Eufic: [Food waste in Europe: statistics and facts about the problem | Eufic](#)

Hooge et al., Journal of Cleaner Production 183 (2018) 698-709. Read **Introduction + Discussion** and **Conclusions** parts.

[Microsoft Word - INF3 Food Loss Wageningen U study \(unece.org\)](#)

High-Value Compounds in Fruit, Vegetable and Cereal Byproducts: An Overview of Potential Sustainable Reuse and Exploitation by A.Z.A. Tlais et al. Read pages **XXX** (to be completed)

[Molecules | Free Full-Text | High-Value Compounds in Fruit, Vegetable and Cereal Byproducts: An Overview of Potential Sustainable Reuse and Exploitation \(mdpi.com\)](#)

Fruit ripening and maturity indices

Wills et al, 2016. Chapt. 3: pp 34-62

Chapt. 6: 119-127, to headline

Chapt.10: pp 199-211 to headline

Alós E, and L Zacarias CHAPTER 7 Ripening and Senescence. *In Postharvest Physiology and Biochemistry of Fruits and Vegetables*. Eds, Yahia & Carrillo-Lopez. Woodhead Publishing.(VPN must used, or to use a SLU computer)

Read pp. 131-135 (to Transcriptional analysis of ACS and...).

[Postharvest Physiology and Biochemistry of Fruits and Vegetables \(ufl.edu\)](#)

Botton A, Tonutti P and Ruperti B. CHAPTER 5, Biology and Biochemistry of Ethylene. *In Postharvest Physiology and Biochemistry of Fruits and Vegetables*. Eds, Yahia & Carrillo-Lopez. Woodhead Publishing. *Read pp. 93-96 (to 5.2.2 Ethylene Perception...), 101 (from 5.3 Ethylene physiology...) – 110 (to 5.5 Biotechnological...)*

[Postharvest Physiology and Biochemistry of Fruits and Vegetables \(ufl.edu\)](#)

Washington State University. Apple maturity and harvest.

<http://treefruit.wsu.edu/web-article/harvest-apples/>

Blankenship, S., Dole, J.M. 1-Methylcyclopropene: a review. 2003. Postharvest Biology and Technology, 28, 1-25. (not included in examination; only as reference literature)

Physiological diseases, plant pathology after harvest

Wills et al, 2016, Chapt.8: pp 164 from headline – 169

UC Davis Postharvest technology: Fruit Physiological Disorders

http://postharvest.ucdavis.edu/Commodity_Resources/Fruit_Physiological_Disorders/

Fergusson, I., Volz, R., Wolf, A., 1999. Preharvest factors affecting physiological disorders of fruit. *Postharvest Biology and Technology*, 15, 255-262.

http://www.avocadosource.com/Journals/Elsevier/phbiotech_1999_15_255-262_Ferguson.pdf

Wills et al, 2016, Chapt.9: 170-188

Agrios G., Plant Pathology 5th Ed. pp. 553-558.

Cooling technology and water loss

Wills et al, 2016. Chapt. 4: pp 63-71, pp 72-73 översiktligt, pp 74-89

Chapt 5: 90-106

Chapt 7: 129-152

Chapt.8: pp 159, from headline -164.

Seaton, K. Reid A. 2015. Cooling cut flowers and foliage. Department of Primary Industries

and Regional Development's Agriculture and Food division, Government of Western Australia:
<https://www.agric.wa.gov.au/nursery-cutflowers/cooling-cut-flowers-and-foliage>

Tian D., Fen L., Jiangang L., Mengli K., Jingfen Y., Xingqian Y., DongHong L., Comparison of different cooling methods for extending shelf life of postharvest broccoli. *Int J Agric & Biol Eng.* 9, 6, 178-184, 2016. (choose "pdf")
<http://www.ijabe.org/index.php/ijabe/article/view/2107>

CA, DCA, MAP (atmosphere during storage)

Wills et al, 2016, Chapt.6: pp 107-118, pp 127 from headline - 128

Falagán N. and Terr LA. Recent Advances in Controlled and Modified Atmosphere of Fresh Produce. *Johnson Matthey Technol. Rev.*, 2018, 62, (1)
https://dspace.lib.cranfield.ac.uk/bitstream/handle/1826/12932/Recent_advances_in_controlled_and_modified_atmosphere-2018.pdf?sequence=1&isAllowed=y

Mditshwaa A, Fawolea OA, Opar UL. Recent developments on dynamic controlled atmosphere storage of apples—A review. *Food Packaging and Shelf Life* 16 (2018) 59–68.
<https://agris.fao.org/agris-search/search.do?recordID=US201800215012>

Packaging and handling

**Wills et al, 2016. Chapt.11: pp 216-245 till headline
Chapt. 12: pp. 260 from headline – 262 till headline**

Boyette, M. D., Sanders, D. C., Rutledge, G. A. Packaging requirements for fresh fruits and vegetables. NC State Extension Publications.
<https://content.ces.ncsu.edu/packaging-requirements-for-fresh-fruits-and-vegetables>

Thompson JE Kader AA. Wholesale Distribution Center Storage. 2001, Issue No. 107
Perishables Handling Quarterly
https://ucanr.edu/sites/Postharvest_Technology_Center_/files/232181.pdf

Giovanell G., Limbo S., Buratti S. Effects of new packaging solutions on physico-chemical, nutritional and aromatic characteristics of red raspberries (*Rubus idaeus* L.) in postharvest storage. *Postharvest Biology and Technology*, 98, 2014, 72–81.
<http://www.sciencedirect.com/science/article/pii/S0925521414001860>

Reference literature (not included in examination other than as general handling recommendations):

K.L.B. Gast, Ph.D., Extension Specialist—Postharvest and Marketing; J. Neujahr, Extension Assistant, K-State Research and Extension Horticulture Division, Kansas State Florists Association. Fresh Cut Flower Handling for Retail Florists (and wholesalers).
<https://www.google.se/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&ved=0ahUKEwjag8C609fYAhUC2SwKHcFuCJMQFggvMAE&url=https%3A%2F%2Fwww.bookstore.ksre.ksu.edu>

[u%2Fpubs%2F261.pdf&usg=AOvVaw0rZfGUrRWBrcvKXWiMirE0](#)

Product development.: New products –which will succeed?

Stewart-Knox, B., Mitchell, P., What separates the winners from the losers in new food product development? *Trends in Food Science & Technology* 14 (2003) 58–64.

[What separates the winners from the losers in new food product development? — Ulster University](#)

Ernst, H. (2002). “Success factors of new product development: a review of the empirical literature”. *International Journal of Management Reviews* 4(1): 1-39.

[\[PDF\] Success Factors of New Product Development: A Review of the Empirical Literature | Semantic Scholar](#) Choose “pdf” when you have opened the link

Product development – theoretical models

To be completed

Human nutrition and importance of horticultural products

Watch the following Youtube video before the lecture (approx. 6 minutes long)

Is the marketable appearance a reasonable indicator of a good nutritional value?

Presenter: Marita Cantwell, Vegetable Specialist, University of California Cooperative Extension, UC Davis.

https://www.youtube.com/watch?v=ZV8Wwk_HBWs

Yahia EM, García-Solís P and Maldonado Celis ME. CHAPTER 2 Contribution of Fruits and Vegetables to Human Nutrition and Health. *In Postharvest Physiology and Biochemistry of Fruits and Vegetables*. Eds, Yahia & Carrillo-Lopez. Woodhead Publishing. *Read pp. 19-27 (to 2.3 Contribution of...)*

[Postharvest Physiology and Biochemistry of Fruits and Vegetables \(ufl.edu\)](#)

+ Chapt. 9. Yahia et al. Carbohydrates. *In Postharvest Physiology and Biochemistry of Fruits and Vegetables*. Eds, Yahia & Carrillo-Lopez. Woodhead Publishing *Read part 9.6 (pp. 195-204)*

<https://www.sciencedirect.com/book/9780128132784/postharvest-physiology-and-biochemistry-of-fruits-and-vegetables>

Liu, R.H., Health-Promoting Components of Fruits and Vegetables in the Diet. *Adv. Nutr.* 4: 384S–392S, 2013; <http://advances.nutrition.org/content/4/3/384S.short>

Food safety

Wills et al, 2016. Chapt.10: 189-198, pp 211 from headline – 215

Chapt.12: pp. 266 from headline – 270

Heaton J.C. and Jones K. Microbial contamination of fruit and vegetables and the behaviour of enteropathogens in the phyllosphere: a Review. *J. Applied Microbiology* 104 (2008)

613– 621

[Microbial contamination of fruit and vegetables and the behaviour of enteropathogens in the phyllosphere: a review - PubMed \(nih.gov\)](#)

Lisa Kitinoja, and Adel A. Kader. 2015. Small-Scale Postharvest Handling Practices: A Manual for Horticultural Crops (5th Edition) - Download Version:

<http://postharvest.ucdavis.edu/Library/Publications/?uid=951&ds=807>

Pp. 258-264 Food safety practices

FDA: HACCP Principles & Application Guidelines:

[HACCP Principles & Application Guidelines | FDA](#)

Start reading at "HACCP principles" a bit down the page., Continue to read "Guideline for application of the HACCP principles" to understand how the work with the principles should be conducted.

SLV: Livsmedelskontroll (in Swedish). The content will be translated.

<https://www.livsmedelsverket.se/produktion-handel--kontroll/livsmedelskontroll>

LRF Trädgård Nationella branschriktlinjer för livsmedelssäkerhet vid produktion av frilandsodlade grönsaker och bär. *Läs pp. 1-26 översiktligt, med focus på vad som ingår i kraven.*

https://www.livsmedelsverket.se/globalassets/produktion-handel-kontroll/branschriktlinjer/branschriktlinjer_frilandsgronsaker_webb.pdf

REFERENCE LITERATURE

KOMMISSIONENS GENOMFÖRANDEFÖRORDNING (EU) nr 543/2011 av den 7 juni 2011 om tillämpningsföreskrifter för rådets förordning (EG) nr 1234/2007 vad gäller sektorn för frukt och grönsaker och sektorn för bearbetad frukt och bearbetade grönsaker

[https://eur-](https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:157:0001:0163:SV:PDF)

[lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:157:0001:0163:SV:PDF](https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:157:0001:0163:SV:PDF)

(not included in examination)

REFERENCE LITERATURE; Food Safety Begins on the Farm: A Grower's Guide:

<https://ecommons.cornell.edu/handle/1813/2209> (not included in examination)

OVERVIEW (not included in examination, but gives a good overview)

Presenter: Marita Cantwell, Vegetable Specialist, University of California Cooperative Extension, UC Davis. In this video, Dr. Cantwell provides an overview of the project and a discussion of basic posthandling principles of fresh fruits and vegetables, and suggestions to maintain quality and shelf-life

<https://www.youtube.com/watch?v=niYA0grUJiE>

Presenter: Marita Cantwell, Vegetable Specialist, University of

California Cooperative Extension, UC Davis. In this video, Dr. Cantwell discusses her observations of product handling and display in WIC markets.

<https://www.youtube.com/watch?v=VIOhS2wP8Ho>