Can safety and quality indicators of fresh produce beyond expiration date help reducing food waste?

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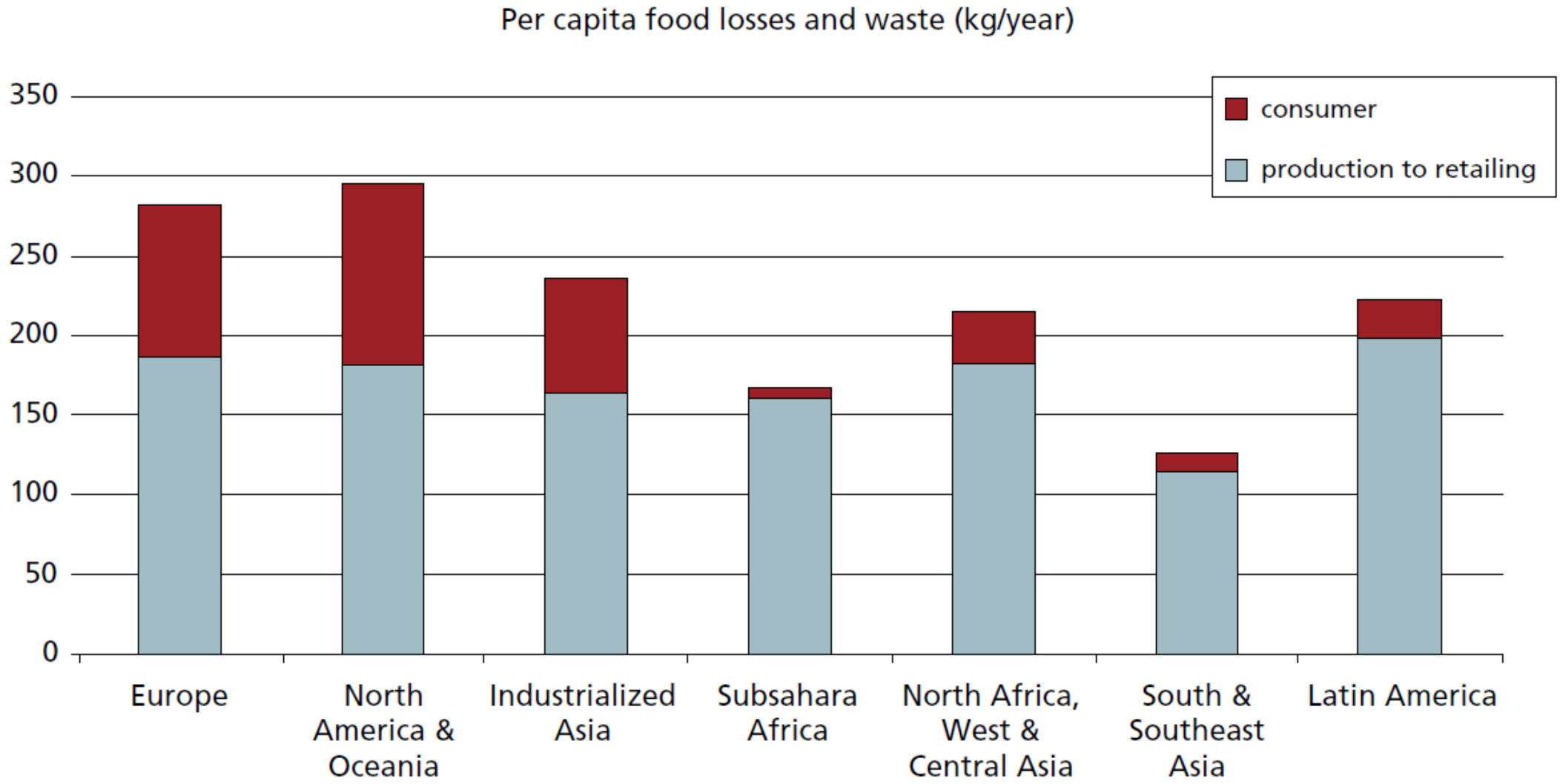
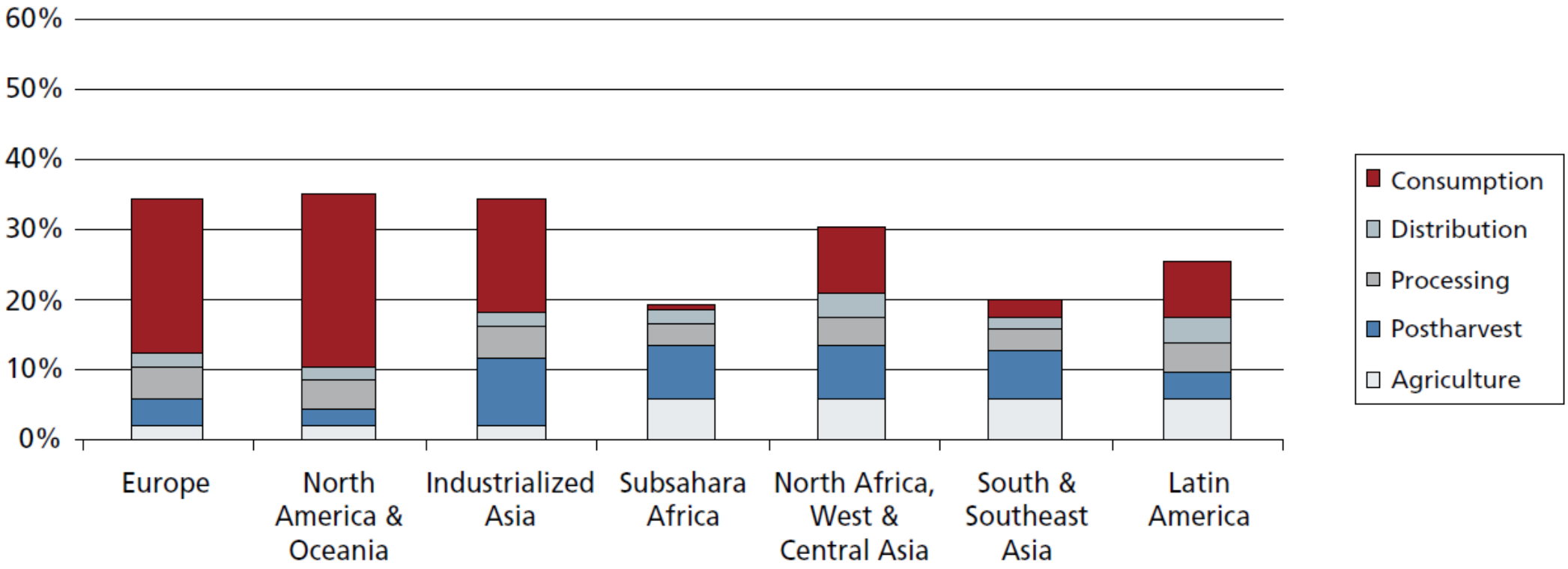
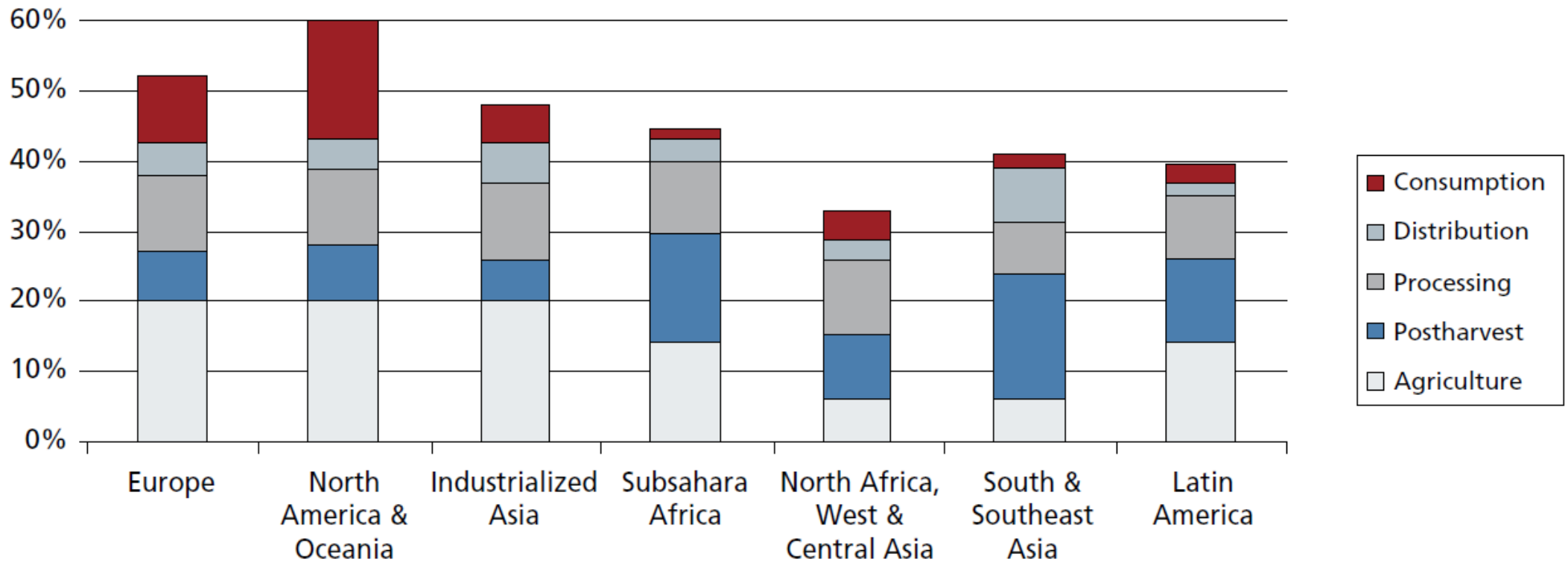
Food losses and waste scenario



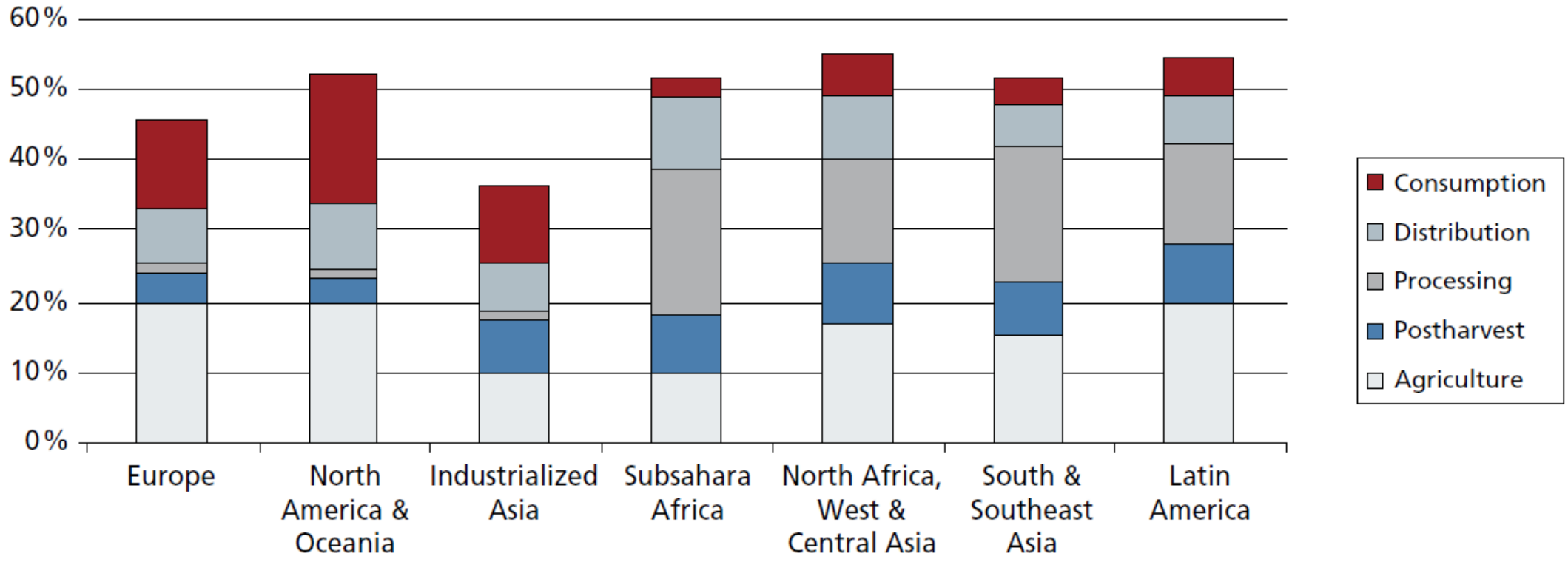
Food losses (Cereal)



Food losses (Roots & Tubers)



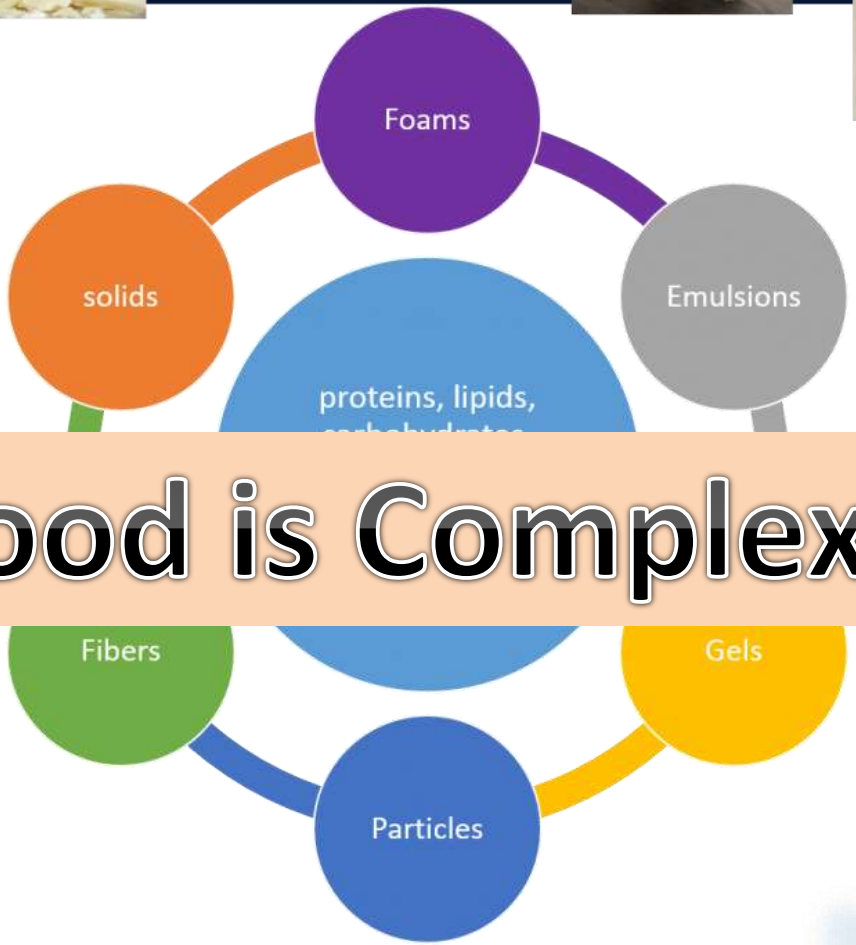
Food losses (Fruits & Vegetables)









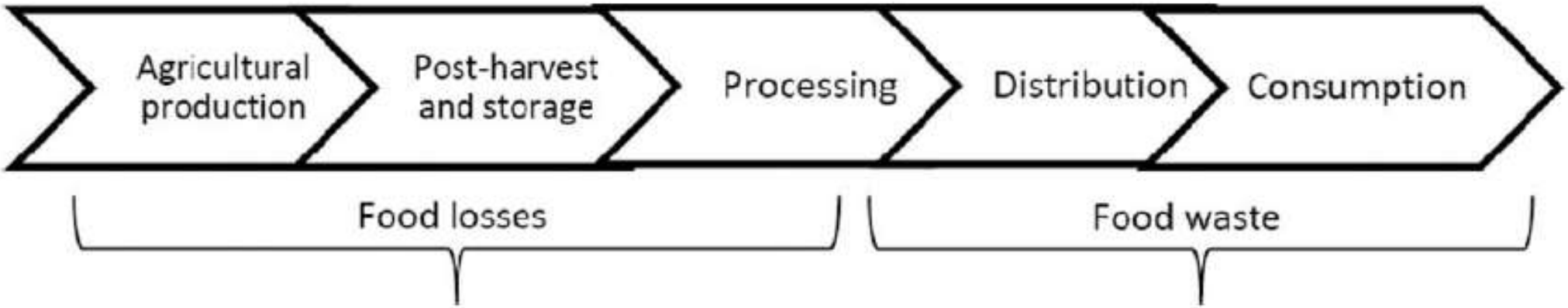









Food is Complex



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Analysis of Physical and Microbial Quality Changes of Fresh Baby Spinach Following the Sell-by Date

Changes in APC count and yeast and mold count

Table 1. Average (± SD) APC[a] count (CFU/g) and yeast and mold count (CFU/g) on packaged, fresh baby spinach on test days 1, 2, 3, and 4, n=3.

Test Day	Mean APC count (CFU/g) (± SD)	Mean Yeast and Mold Count (CFU/g) (± SD)
1) Day 0	$1.37x10^6$ ($\pm 4.6x10^5$) [a]	$6.81x10^2$ ($\pm 3.96x10^2$)
2) Sell-by date	$1.87x10^7$ (est.) ($\pm 9.55x10^5$)[a, b]	$4.60x10^3$ ($\pm 2.33x10^4$)
3) 3 days after sell-by date	$3.95x10^7$ (est.) ($\pm 8.49x10^6$) [a, b]	$4.67x10^4$ ($\pm 6.15x10^4$)
4) 5 days after sell-by date	$5.2x10^7$ ($\pm 2.9x10^7$)[b]	$5.38x10^4$ ($\pm 5.17x10^4$)

Change in Texture

Table 2. Average (±SD) maximum shear force (g) and work of shearing (gsec) on fresh baby spinach on test days 1, 2, 3, and 4, n=3.

Test Day	Average Maximum Shear Force (g) (± SD)	Average Work of Shearing (gsec) (± SD)
1) Day 0	37,833 (±0.544)[a]	232,395 (± 24,363)
2) Sell-by date	37,836 (±1.13)[b]	199,665 (±27,592)
3) 3 days after sell-by date	37,828 (±0.905)[c]	189,566 (±32,046)
4) 5 days after sell-by date	37,836 (±0.508)[b]	221,449 (±11,840)

Change in Color

Table 3. Average (± SD) L, a, and b color values of fresh baby spinach on test days 1, 2, 3, and 4, n=3.

Test Day	Mean L value (± SD)	Mean a value (± SD)	Mean b value (± SD)
1) Day 0	40.3 (±1.68)	-9.15 (±0.471)[a,b]	22.0 (±2.60)
2) Sell-by date	37.9 (±0.794)	-9.03 (±0.316)[a,b]	19.2 (±1.19)
3) 3 days after sell-by date	37.7 (±2.41)	-8.56 (±0.120)[a]	18.9 (±0.291)
4) 5 days after sell-by date	40.2 (±3.05)	-9.40 (±0.243)[b]	20.5 (±0.814)

Take home message

- Consumer Perception and responsibility.
- Reducing confusion on the date labeling.

Thank You

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