



Ready-to-eat (RTE) Avocados

The last decade has seen a tremendous increase in the variety of foods consumed. Tropical fruit such as avocado, mango and papaya has become especially popular, despite the unpredictability of ripeness at purchase. To respond to consumer preferences for ripe and tasty fruit, importers of tropical fruit developed a concept called 'ready to eat' (RTE). To achieve RTE status before delivery to supermarkets, fruit is kept in special ripening rooms until it is close to the desired quality. Once ripe, fruit has a limited shelf life and quickly becomes soft and overripe. To ensure that fruit delivered to supermarkets is RTE but still has an acceptable shelf life, it is important to accurately determine its ripeness.

The question asked by the GreenCHAINge WP was: How can we objectively determine the ripeness of avocado fruit?

Ripeness classes

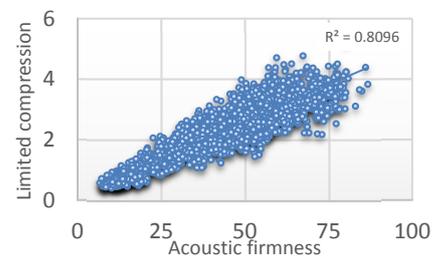
Ripening protocols for avocado were developed within work package 6 of the GreenCHAINge project. To evaluate these protocols, Wageningen University and Research defined a ripeness scale based on fruit firmness. The scale consists of five classes ranging from class 1 (ripened but still too unripe to eat) to class 5 (clearly overripe). A class 1 avocado is too firm and lacks the characteristic avocado flavour, while a class 5 avocado displays pulp discoloration and has a typical overripe off-taste. Avocados in classes 2 to 4 are deemed to be RTE, with class 2 during delivery to supermarkets just right to ensure perfect quality for consumers and minimal waste.

Measuring firmness to determine ripeness

Measuring the firmness of fruit is the most reliable way to assign a ripeness score. Firmness can be measured with great precision using a penetrometer, but this makes a fruit unsellable. Two non-destructive methods, the acoustic firmness measurement and the limited compression method, were therefore employed in combination instead.

Ripeness class	Description	Acoustic [$\text{Hz}^2\text{g}^{2/3}\text{d}^{-1}$]	LC (kg)
1	Not RTE, too hard	> 22	> 1.3
2	RTE, slightly too hard	18.3 - 22	0.93 - 1.3
3	RTE, perfect	11.3 - 18.3	0.66 - 0.93
4	RTE, slightly too soft	9 - 11.3	0.53 - 0.66
5	Not RTE, too soft	< 9	< 0.53

Ripeness classes correlated with degrees of firmness established by acoustic and limited-compression methods.



Correlation between acoustic-firmness and limited-compression measurements.

For detailed information about this project result please visit www.wur.eu/greenchainge.





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