

Sinclair seeks to define consumer acceptance parameters

The manufacturer claims results of recent studies show that its SIQ-FT can be used by fruit packers to simulate consumer-judged acceptance categories

As the need for reliable, online, non-destructive techniques for the measurement of fruit characteristics becomes increasingly important, it is essential to ensure that the ability of testing equipment to add value and quality to produce is constantly evaluated.

With this in mind, Sinclair iQ, a division of Sinclair International Ltd, developer of the non-destructive internal quality-firmness tester SIQ-FT, has carried out a series of studies at its Norwich facility to develop the relationship between SIQ-FT measurements and consumer judgements on fruit texture and quality.

In conjunction with major packhouses around the world, research and trials have been undertaken on a number of key products, including apples and avocados. A typical trial involves measure the firmness of a sample of fruit using the SIQ-FT, then asking a panel of consumers to taste the same fruit and classify it in categories according to texture, acceptance or ripeness. Further trials use a trained sensory panel who score the fruit on a descriptor rating that is a characteristic of the fruit.

According to Sinclair, results of the tests indicate that the SIQ-FT segregates between sensory



The SIQ-FT tests every fruit online at commercial packing speeds of up to 600 fruit per minute, sorting the produce by firmness grade. The system also provides a real time display and continuous record of firmness for every fruit tested.

It utilises four low-mass impact sensors, which each touch the fruit at four different places around the circumference whilst online, using Sinclair's patented bellows technology.

The sensors consist of a piezoelectric crystal that deforms on impact, producing a small voltage that can be used to assign iQ firmness values. An overall value generated by the four sensory readings, is assigned to each fruit on a scale of 1 to 99, the lower value representing the softer fruit.

The technology, which can be likened to a hand gently squeezing fruit, has already been successfully applied to a range of products including avocados, apples, kiwifruit, stone fruit

acceptance categories efficiently and correlates well with sensory descriptors such as crunchiness.

The performance of the SIQ-FT system in relation to mechanical measures was also investigated, including the penetrometer, which is the industry standard for most fruit. The relationship between the two measures was found to be strong even though in some cases the SIQ-FT measures a different aspect of fruit firmness.

“Sinclair’s research findings have shown the SIQ-FT can be used by fruit packers to simulate consumer judged acceptance categories with pre-determined cut-off values,” Sinclair iQ’s sensory and consumer research consultant Carol Raithartha, tells Eurofruit Magazine. “This information can then be used to devise iQ firmness categories that are linked to consumer acceptability.”

To date, trials have focused mainly on apples but the company is currently compiling data for many varieties in order to build an in-depth knowledge of how consumer acceptance levels relate to SIQ-FT measurements.

Meanwhile Ms Raithartha says results of tests on the correlation between SIQ-Ft measurements and consumer sensory descriptors for avocados have proved equally promising.

During the research, a trained sensory panel tasted avocados and rated the fruit on a scale of 1 to 10 for a variety of objective descriptors, such as creaminess, while the external firmness of the avocados was assessed by gently squeezing the fruit and rating its firmness on a scale of 1 to 10. the relationship between the SIQ-FT and the penetrometer was also investigated and compared.

and mangoes.

Sinclair says the machine is compatible with most major fruit sizing and grading equipment and its software can be used to sort fruit into up to six different firmness bands.

In this case, Ms Raithartha says the SIQ-FT performed as well as or better than the penetrometer for predicting panel-judged external firmness and creaminess. “Overall, the data shows that the SIQ-FT is a useful tool for assessing the attributes of avocados, which relate directly to consumer perceptions,” she says.

Ms Raithartha is confident that continued research into the correlation between consumer acceptance levels and SIQ-FT measurements will play a crucial role in increasing consumption levels.

“Proven technologies will allow for the implementation of new marketing initiatives – such as Ready To Eat and Eat Me Keep Me fruit – and ensure that fruit quality can be raised to consistently meet the expectations of the consumer and resulting in a higher demand for higher quality fresh produce.