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Restoration Flavours – A Flavourists Perspective
October 2010

All in 30 minutes

- **The Essence of Fruit Juice**
- **Origins**
- **The Restoration Creation Palette**
- **What does a Flavourist do ?**
- **Hot Juice**

The Essence of Fruit Juice

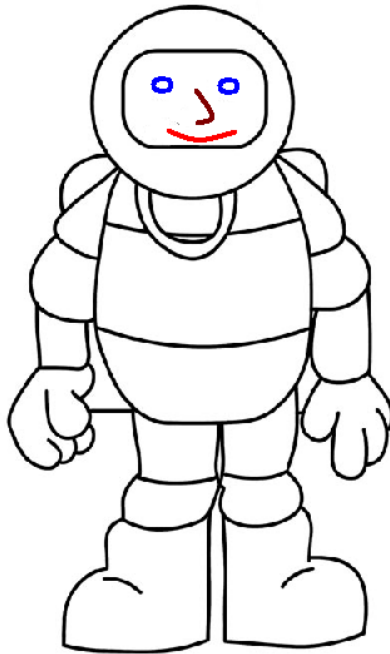
Egyptian preservation of pharaohs involved preservation of their vital organs and mummification of the remains to be reunited in the after-life



The Essence of Fruit Juice

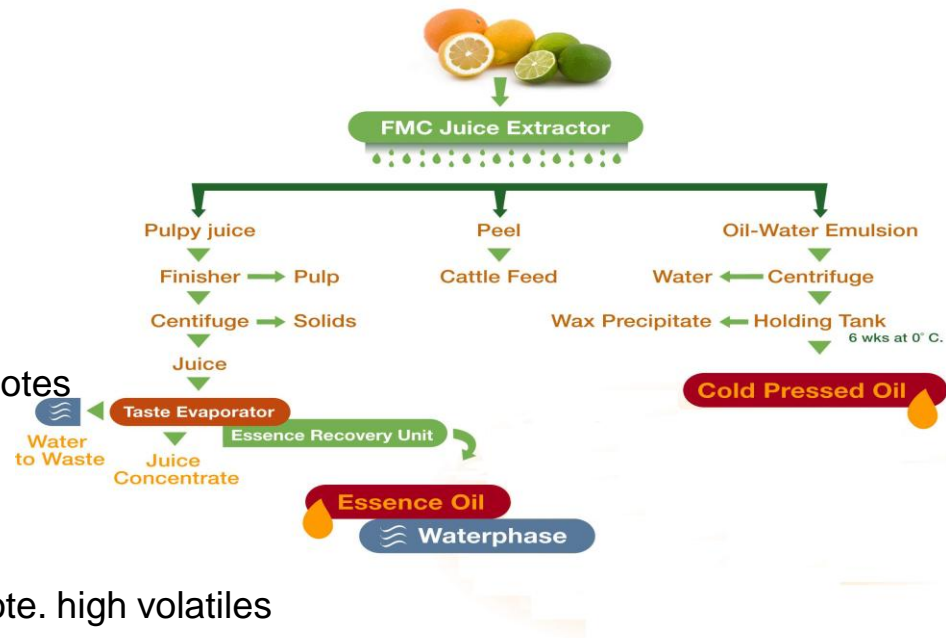
Four and a half thousand years later.....

Faced with the challenge of travel over vast distances in space, some Science Fiction authors came up with inventive schemes to enable transport of human with maximum payload



The Essence of Fruit Juice

- Cold Pressed Oil
 - From the peel
 - Provides Body, Base notes
- Essence Oil
 - From the juice
 - Provides fresh, juicy, fruity notes
- Water-phase (Aroma)
 - From the juice
 - Provides fresh, green, topnote. high volatiles



The Essence of Fruit Juice

Consider Orange from Brazil



Juice production in vicinity of citrus groves to make juice concentrate. This enables use of fruits not destined for the market, but still of good quality. The concentration allows for efficient Global shipment

Consider NFC, again local production where processing is less intensive. But shipment is much more bulky (5 times + volume)

Tinned whole fruit. Processed at source. Shipping costs higher due to packaging (more bulk) but shelf-life is longest. Peel can be processed at source for oil

Fresh fruit for table – Slightly more bulk (whole fruit) important that no damage is done to fruit in transit as appearance is highly valued in Supermarkets

Some of this may be used within Europe for 'Fresh squeezed juice'



Origins

Citrus Juice Extractor



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Origins

Lemon Peel After Juice Extraction



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Origins

Clarified Peel Oil



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Origins

From the production of Juice concentrate two important raw materials used in restorations are obtained

From the initial removal of water the volatiles from the juice may be condensed

This fraction separates into two layers

Essence oil (colourless essential oil)- from citrus juices only

And

Waterphase (Aroma)

Essence Recovery Unit



Origins

A Variety of Separation Technologies suitable for Restoration uses



Distillation

- Separates based on boiling point

Extraction

- Separates based on solubility

Molecular Distillation

- Separates based on boiling point, under UHV

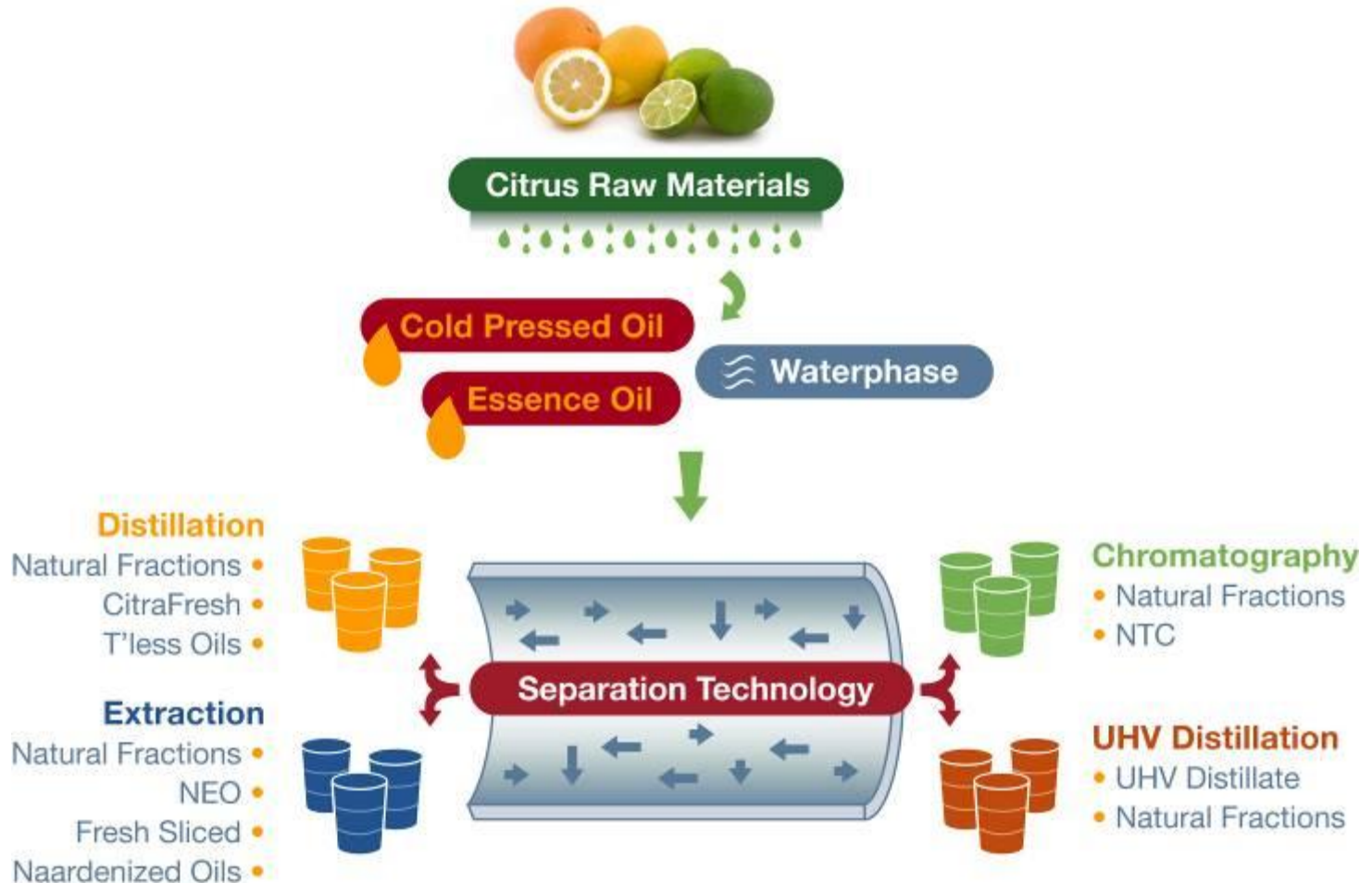
Chromatography

- Separates based on resin affinity

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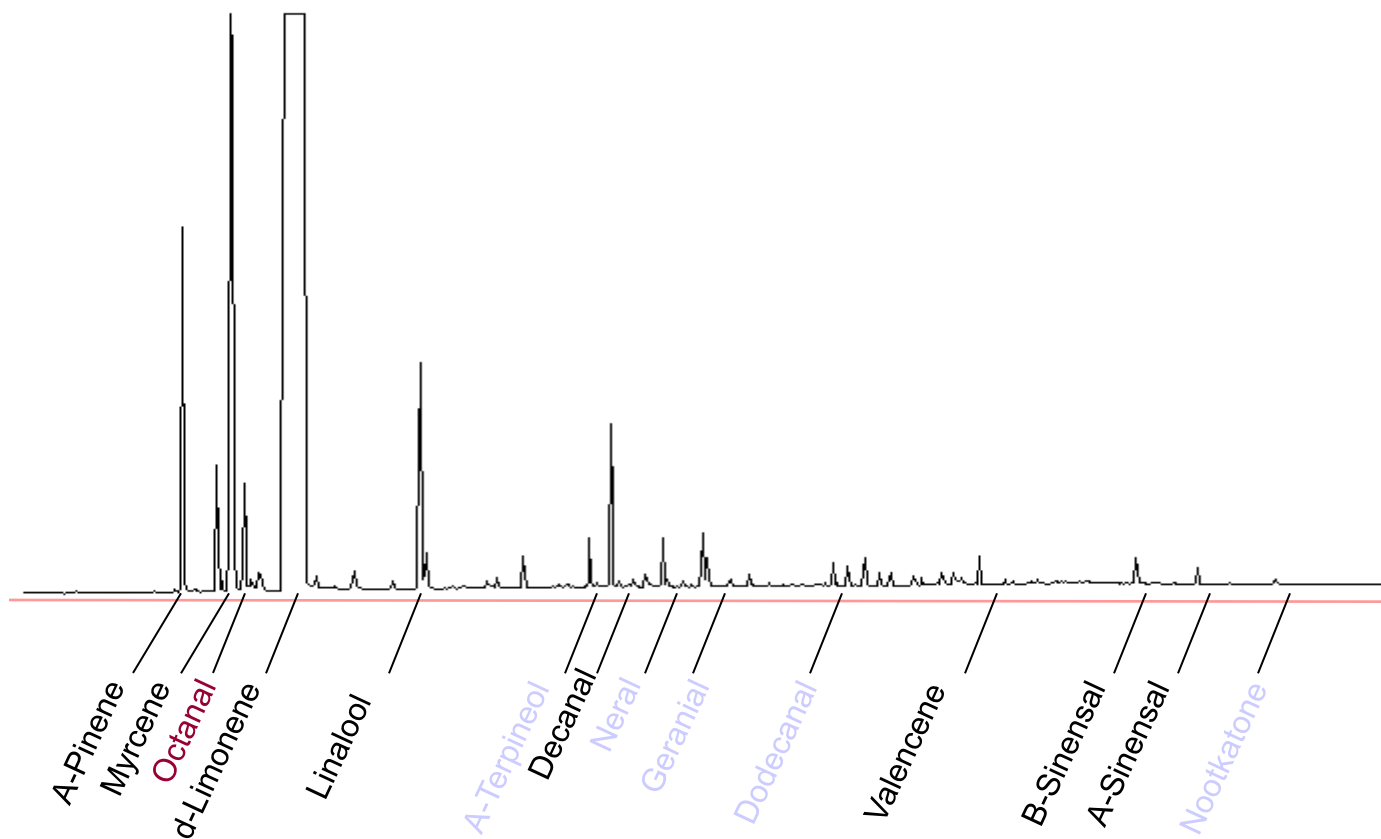


The Restoration Creation Palette



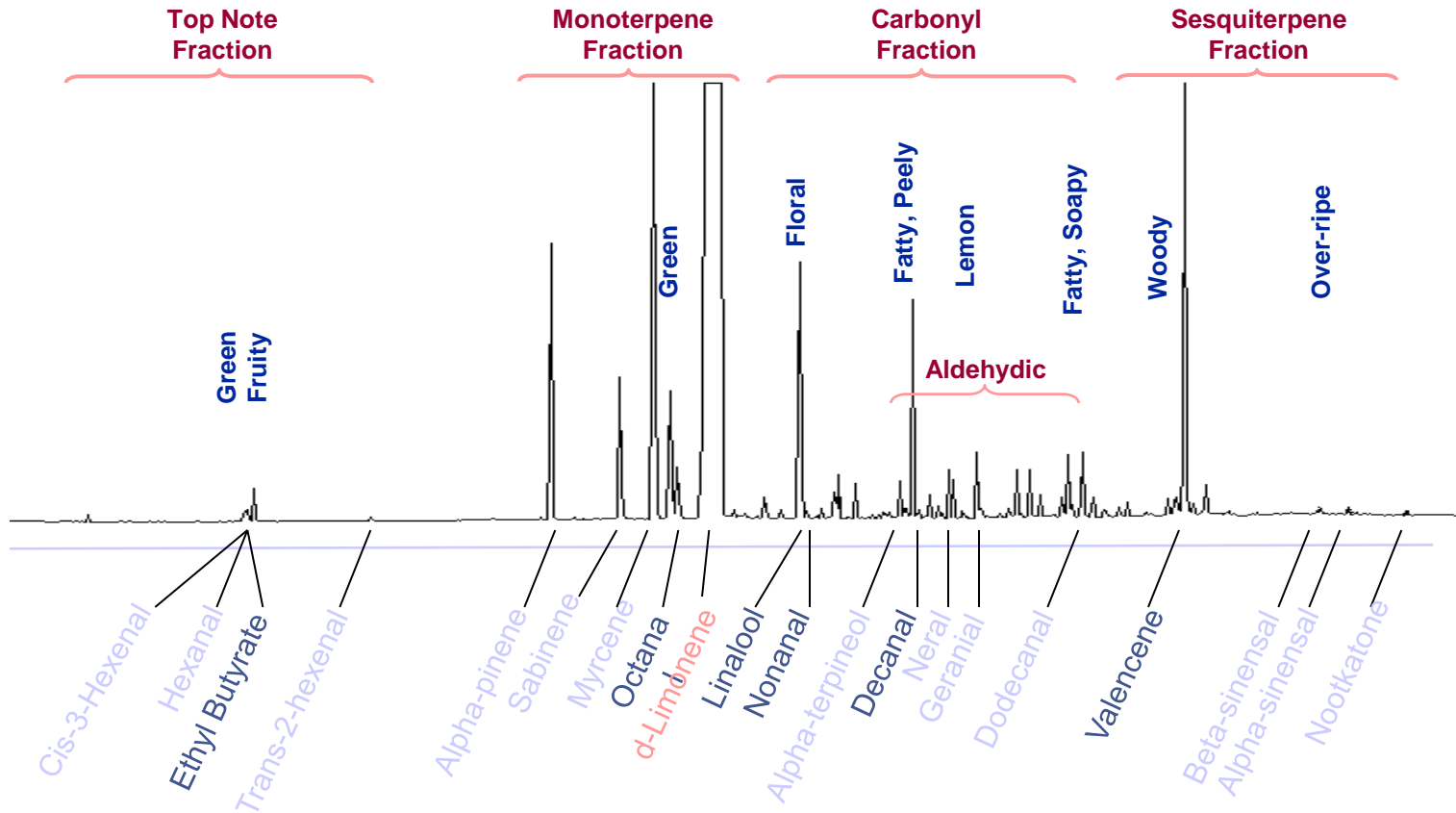
The Restoration Creation Palette

Cold Pressed or Expressed Peel Oil



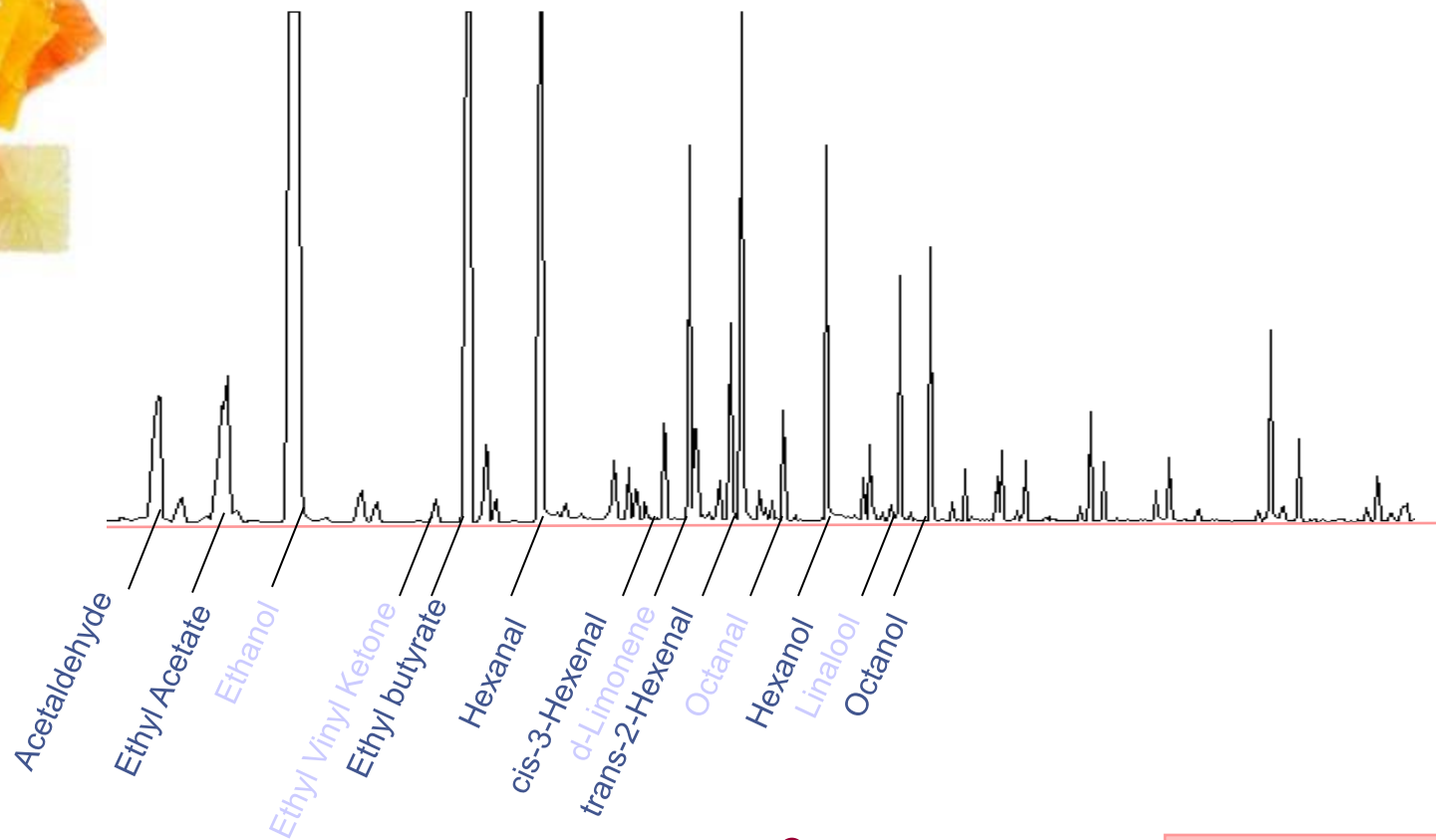
The Restoration Creation Palette

Fractionation of Orange Essence Oil



The Restoration Creation Palette

Orange Waterphase



What does a Flavourist do ?

Restoration flavours “restore” the flavour by “adding back” key components which are lost during the process of producing the fruit juice



100% juice
From Concentrate



Nectar
Fruit juice / puree
+ water + sugar



Juice drink
Juice + ...

Restoration Flavours
“add backs”

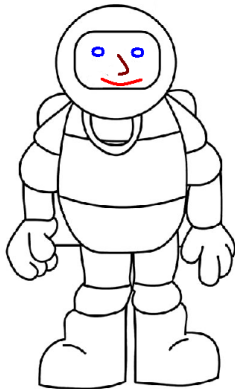
Natural “source” flavours
Natural “source” flavours WONF
Natural flavours
Flavours
Juice Compounds

What does a Flavourist do ?

- Flavourist spend many years learning about the thousands of extracts, oils, fractions and specific chemicals which we may use in food and drinks

Restoration flavour challenges are greater due to a reduced palette

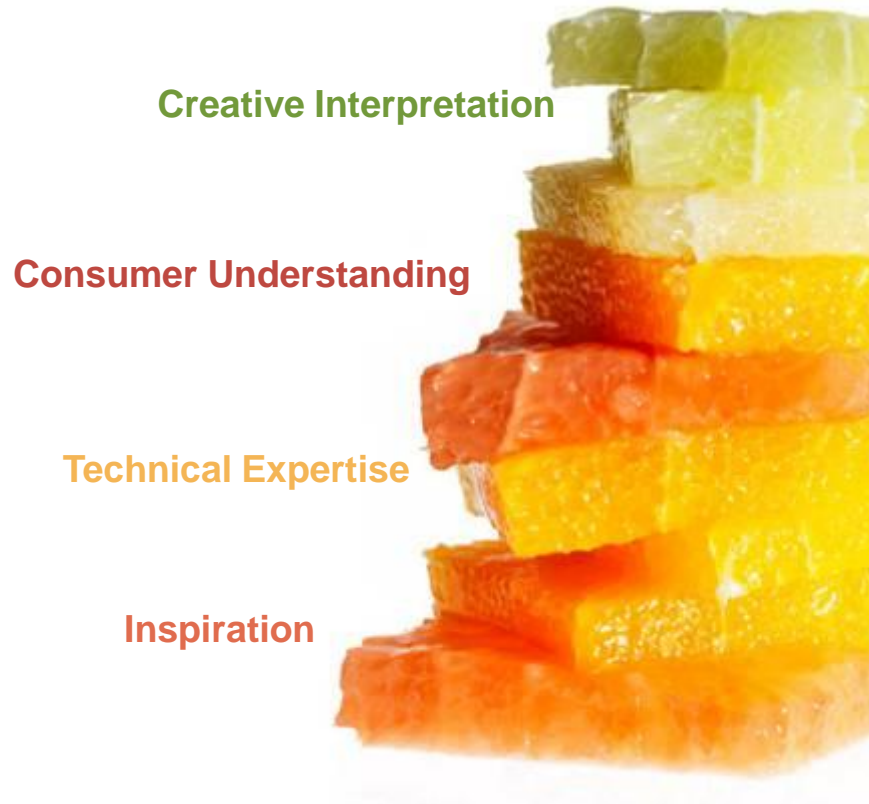
- The oils/aromas may be fractionated or physically concentrated which enable novel characteristics to be tuned down, or amplified



- Recall the Spaceman;
- Understanding which volatile components are the essence of 'Orange' Decanal, D-Limonene These are the Brain and Heart
- Which other components are characterising, such as Ethyl Butyrate fruitiness or Hexanal green notes Are like colour of eyes or shape of the nose. Elements that differentiate, not define



What does a Flavourist do ?



- Establish what the target profile is;
 - Based on desirable sensory attributes
 - Measurable volatile components
- Determine existing levels of flavour components already in the juice concentrate
- Ideally that difference is then to be filled. Focusing on specific notes in the final juice that require rebalance
- Ensure during processing and anticipated storage prior to consumption, these levels may be delivered

What does a Flavourist do ?

Regulations and Guidelines.

- Where market indicates that Restoration **Must** be made to a concentrate, it is reasonable that minimum markers be set to ensure that is the case
- Many factors need to be considered when defining which markers or combination of markers should be used including ; reflecting the diversity in nature, what level is sustainable, these also need ultimately to align with consumer expectations of profile
- Where the Restoration **May** be made, clearly there is arguably no requirement for minimum markers
- The role of the Flavourist is to understand those needs, this will give a framework to any Restoration Flavour created

The situation of needing to meet minimum levels of may define that each flavour needs to be bespoke to any particular juice concentrate and may require dosage adjustment to ensure that any minimum levels are being achieved



Hot Juice

- As indicated FCOJ is one of the most globally recognised commodities
- In a market-place with so much competition, what may be done to differentiate a specific brand of juice resulting in repeat purchase and brand loyalty
- Authenticity of profile
- Consistency of product
- Novelty that is liked by consumer



Hot Juice



Citrus Variety Collection

- Givaudan continues to work with UCR Citrus Variety Collection to gain deeper insight into the nature of the odour active ingredients in citrus fruits
- Understand the effects on the seasonal variation in the fruit flavour composition
- Translate that understanding in creation of flavour profiles that meet the need of a diverse global market seeking new and different profiles
- Much of this work is intended for the wider beverage market, but the juice insights gained will also benefit creations in the restoration area within the requirements of Restoration Flavours



Hot Juice

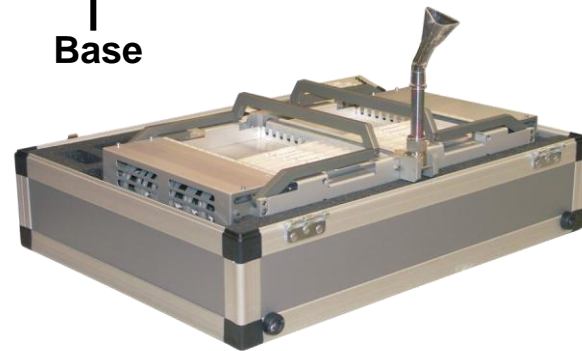
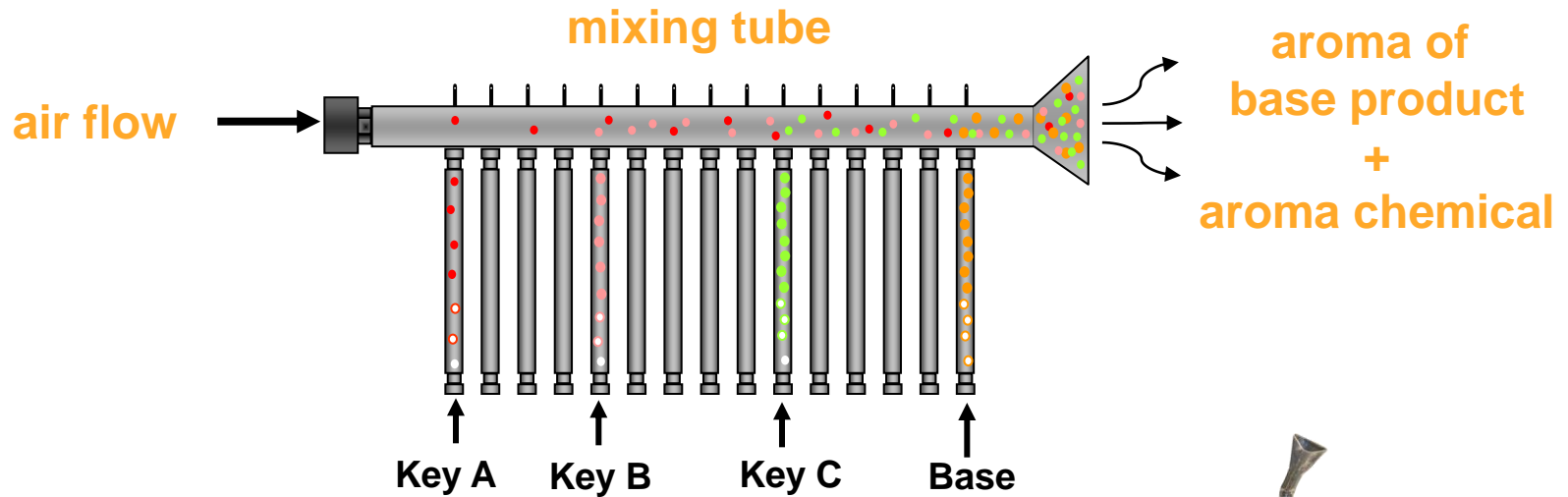
Widening our understanding of the fruit and juice

- Nature provides an abundance of fruit profiles
- Commercial groves limit on the basis of yield, disease resistance and commercially measurable markers such as colour, acidity and solids
- By investigating historical varieties which gave novel flavour, maybe no longer grown, looking at the balance of components gives us insight to recreate those lost profiles
- A Restoration blend can help to impart a profile more in the direction of these original fruits of the same species



Hot Juice

Creation Tools - MiniVAS™



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