

# EUREST-FLAVOURS

European Regulatory Science on Tobacco-Flavours

Chafea/2016/Health/36 single FWC on Tobacco Products

## Characterising flavours in tobacco products

### Constantine Vardavas

MD, RN, MPH, PhD, FCCP, ERT

# Declaration

- ✓ No conflicts of interest to declare.
- ✓ All positions are personal.
- ✓ The content/interpretation of these slides are my own and may not necessarily reflect the views of the European Commission nor IAP or the TG.

# Legal Background

## **Directive 2014/40/EU**

- on the approximation of the laws, regulations and administrative provisions of the Member States concerning the manufacture, presentation and sale of tobacco and related products and repealing Directive 2001/37/EC

## **Commissions Implementing Decision (EU) 2016/786**

- laying down the procedure for the establishment and operation of an independent advisory panel assisting Member States and the Commission in determining whether tobacco products have a characterising flavour

## **Commission Implementing Regulation (EU) 2016/779**

- laying down uniform rules as regards the procedures for determining whether a tobacco product has a characterising flavour

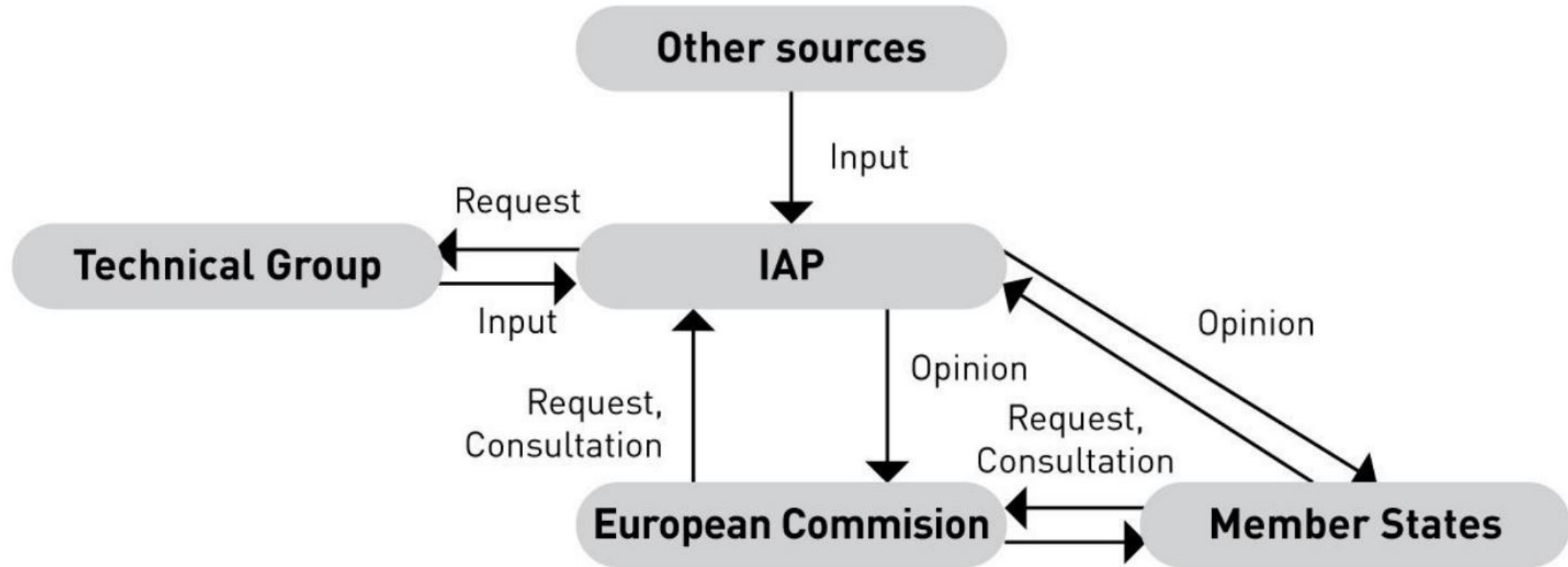
# Background

- Member States shall prohibit the placing on the market of tobacco products (cigarettes and roll-your-own (RYO) tobacco) with a characterising flavour
- For the determination of a characterising flavour, Member States and the Commission may consult an Independent Advisory Panel (IAP)
- As appropriate, IAP shall request input from the **technical group of sensory and chemical assessors** that was established by the Commission

# Technical group

- The Technical Group:
- carries out sensory and chemical assessments
- based on a comparison of the smelling properties of the test product with those of reference products

# Process



# Characterising flavour

- 'Characterising flavour' means a clearly noticeable smell or taste other than one of tobacco, resulting from an additive or a combination of additives, including, but not limited to, fruit, spice, herbs, alcohol, candy, menthol or vanilla, which is noticeable before or during the consumption of the tobacco product;
- The methodology for sensory analysis shall be based on a comparison of the smelling properties of the test product with those of reference products.

# Fixed vocabulary

- The expert sensory panel has been trained using a fixed vocabulary.
- Directly linked to chemical substances and individual odour attributes.
- Specific labels are used to identify specific chemicals.



# Odour attributes that may potentially originate from tobacco include:

- green pepper, potato skin, citronella and cedar, which may be derived directly from tobacco plant metabolism;
- black tea, rotted dry wood, violet and saffron, which may be derived from the chemical breakdown of carotenoid pigments in tobacco leaves during curing;
- cardboard, cucumber, freshly cut grass and hay, which may be derived from the oxidation of lipids in tobacco leaves during curing;
- cheese, which may be derived from hydrolysis of lipids in tobacco leaves during curing;
- sweetcorn, which may be derived from the breakdown of amino acids during drying of tobacco;
- vinegar which may be derived from the action of microorganisms during tobacco processing;
- smoky and burnt coffee, which may originate in the smoke generated in materials other than tobacco which may be used to dry “fire-cured” tobacco;
- dried leaves, prune and raisin, which may be of uncertain origin but found to occur at noticeable levels in all commercial tobacco products tested.

# Odour attributes that may potentially originate from a source other than tobacco include:

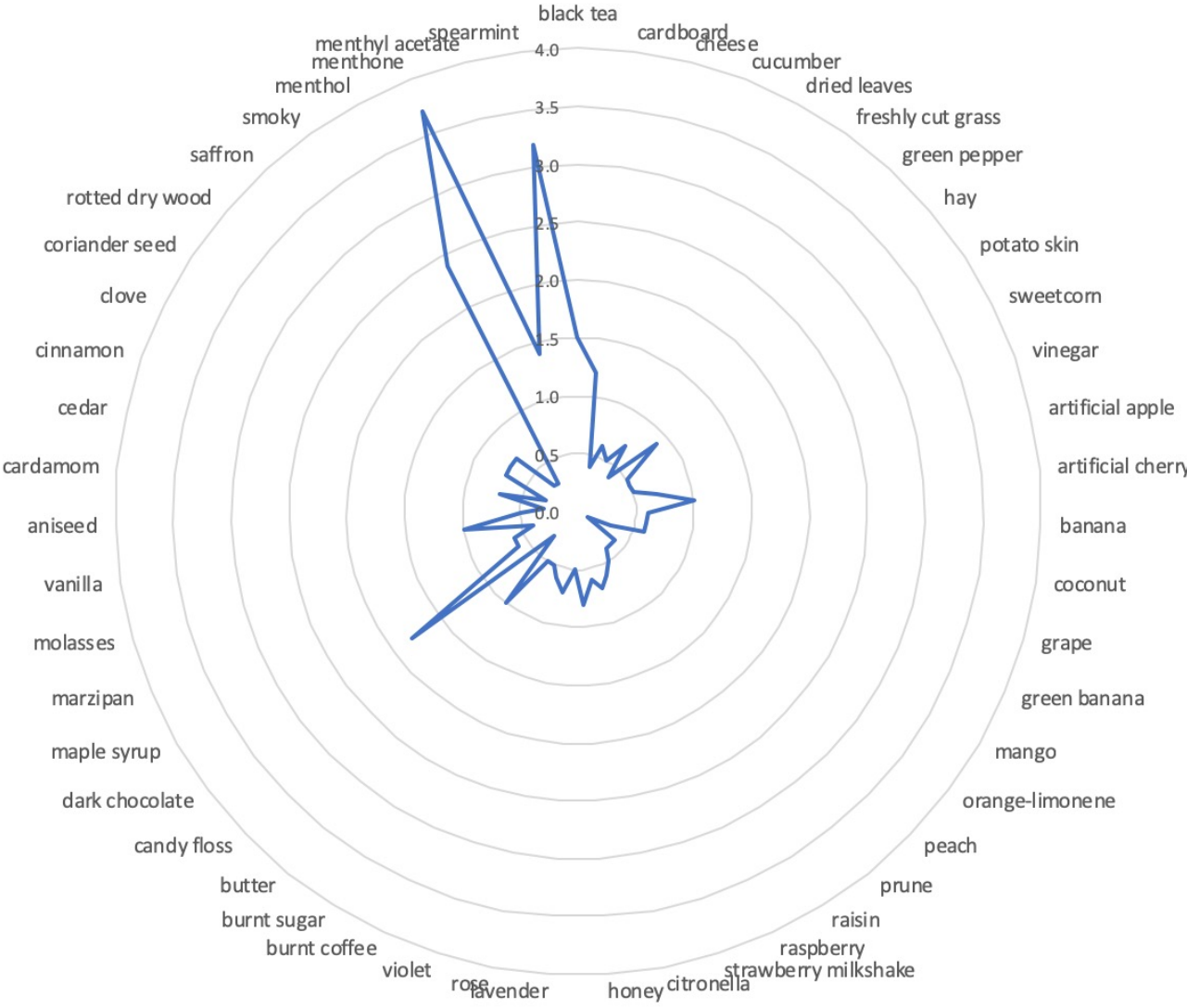
- **Fruity odour attributes**, such as artificial apple, artificial cherry, banana, coconut, grape, green banana, mango, orange-limonene, peach, raspberry or strawberry milkshake;
- **Mint-like** odour attributes, such as menthol, menthone, methyl acetate and spearmint;
- **Sweet attributes**, such as burnt sugar, dark chocolate, honey, maple syrup and molasses;
- **Confectionary-like** odour attributes, such as butter, candy floss, marzipan and vanilla;
- **Spicy** odour attributes, such as aniseed, cardamom, cinnamon, clove and coriander seed;
- **Floral** odour attributes, such as lavender and rose.

# Sensory Analysis Descriptive Profiling

- Each sample evaluated on 51 individual aroma attributes using a 0 – 10 point scale
  - *12 assessors with 3 replicates –36 identical samples*
- Mean values of individual attribute intensities **ranked from largest to smallest.**
- Decoy and reference samples are included

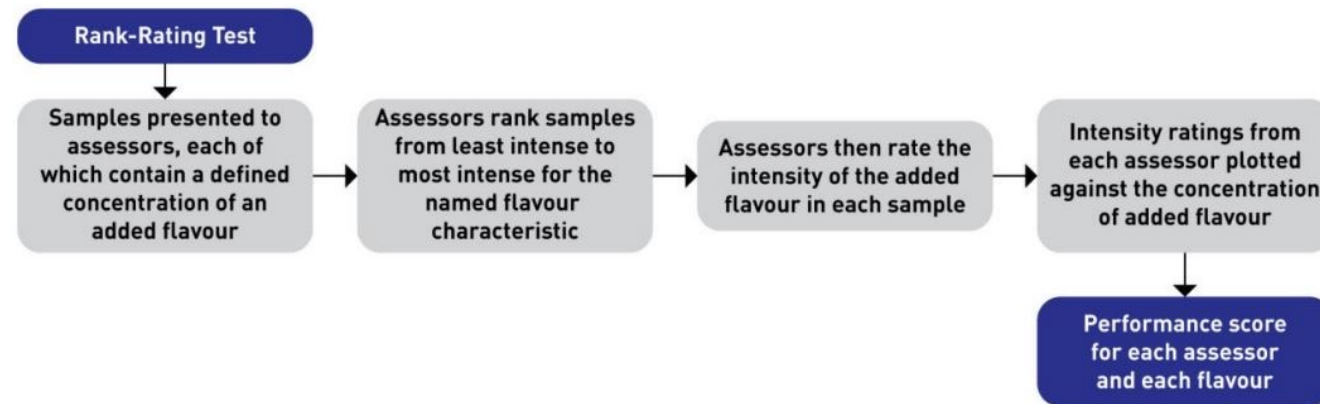
# Descriptive profiling- *example*

Results shown are mean odour intensities from three triplicate determinations by 12 assessors



# Rank Rating

- A construct odor is agreed. (I.e. Chocolate mint etc)
- Assessors rate the intensity of the composite attribute in each of the ranked samples using a scale of 0 - 10



# Chemical Testing

GC-MS analysis, full scan

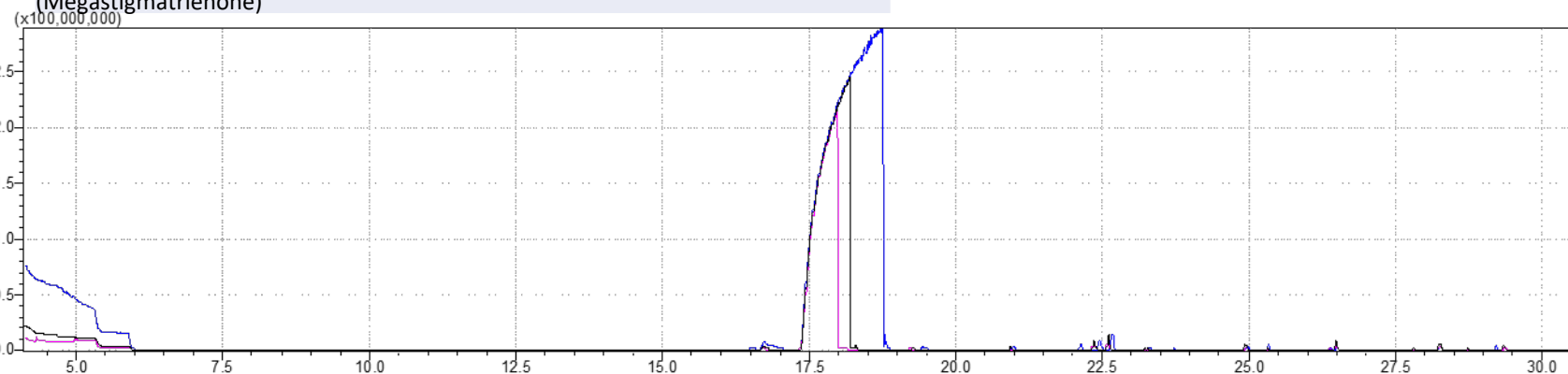
## Chemical Profile Compounds

Hexane  
2-Ethylhexan-1-ol (2-Ethylhexanol or Ethyl Hexanol)  
(1R,2S,5R)-5-methyl-2-prop-1-en-2-ylcyclohexan-1-ol (Isopulegol)  
(2S,5R)-5-methyl-2-propan-2-ylcyclohexan-1-one (Menthone)  
5-Methyl-2-(propan-2-yl)cyclohexan-1-ol (Menthol)  
2-chloro-4-methyl-1-propan-2-ylcyclohexane (Menthyl Chloride)  
[(1R,2S,5R)-5-methyl-2-propan-2-ylcyclohexyl] acetate (l-menthyl acetate)  
3-(1-methylpyrrolidin-2-yl)pyridine (Nicotine)  
(E)-(6E)-8-methyl-5-propan-2-ylnona-6,8-dien-2-one (Solanone)  
4-methyl-1-propan-2-ylbicyclo[3.1.0]hexan-3-ol (Isothujol)  
(E)-1-(2,6,6-trimethylcyclohexen-1-yl)but-2-en-1-one (Beta-Damascone)  
(5Z)-6,10-dimethylundeca-5,9-dien-2-one (Neryl Acetone or Geranylacetone)  
4,4,7a-trimethyl-6,7-dihydro-5H-1-benzofuran-2-one (2(4H)-Benzofuranone, 5,6,7,7a-tetrahydro-4,4,7a-trimethyl-, (R)-)  
2,6-ditert-butyl-4-methylphenol (Phenol, 2,6-bis(1,1-dimethylethyl)-4-methyl)  
2,4-ditert-butylphenol (Phenol, 2,4-bis(1,1-dimethylethyl)-)  
4-[(1E)-buta-1,3-dien-1-yl]-3,5,5-trimethylcyclohex-2-en-1-one (Megastigmatrienone)

## Quantification of target odour chemical compounds:

The following chemical compounds were detected in the sample product, with the following concentrations:

- Menthone 1,258 ug/gr
- Menthol 2375,389 ug/gr



# Further Reading



## Annex

Methodology for the technical assessment of test products assisting in  
determining tobacco products with a characterising flavour

Application to cigarettes and roll your own products

Approved by the Independent Advisory Panel on characterising flavours in tobacco products at the  
21<sup>st</sup> meeting held on 24 June 2020, minor editorial amendments were made on the 2<sup>nd</sup> September  
2020

[https://ec.europa.eu/health/sites/default/files/tobacco/docs/  
methodology\\_technical-assessment\\_test-products\\_en.pdf](https://ec.europa.eu/health/sites/default/files/tobacco/docs/methodology_technical-assessment_test-products_en.pdf)

Thank you!

[Vardavas@tobcontrol.eu](mailto:Vardavas@tobcontrol.eu)