



Managing Cancer Risk from Very Hot Beverages

Influence of Brewing Temperature on Sensory Characteristics of Coffee

Dirk W. Lachenmeier, Jéssika Morgado, Alessandro Maia and Adriana Farah





WHO-IARC Classification

1991 (IARC Monographs Vol. 51):

Coffee drinking: possibly carcinogenic to humans
(Group 2B)

2016 (IARC Monographs Vol. 116):

Coffee drinking: unclassifiable (Group 3)

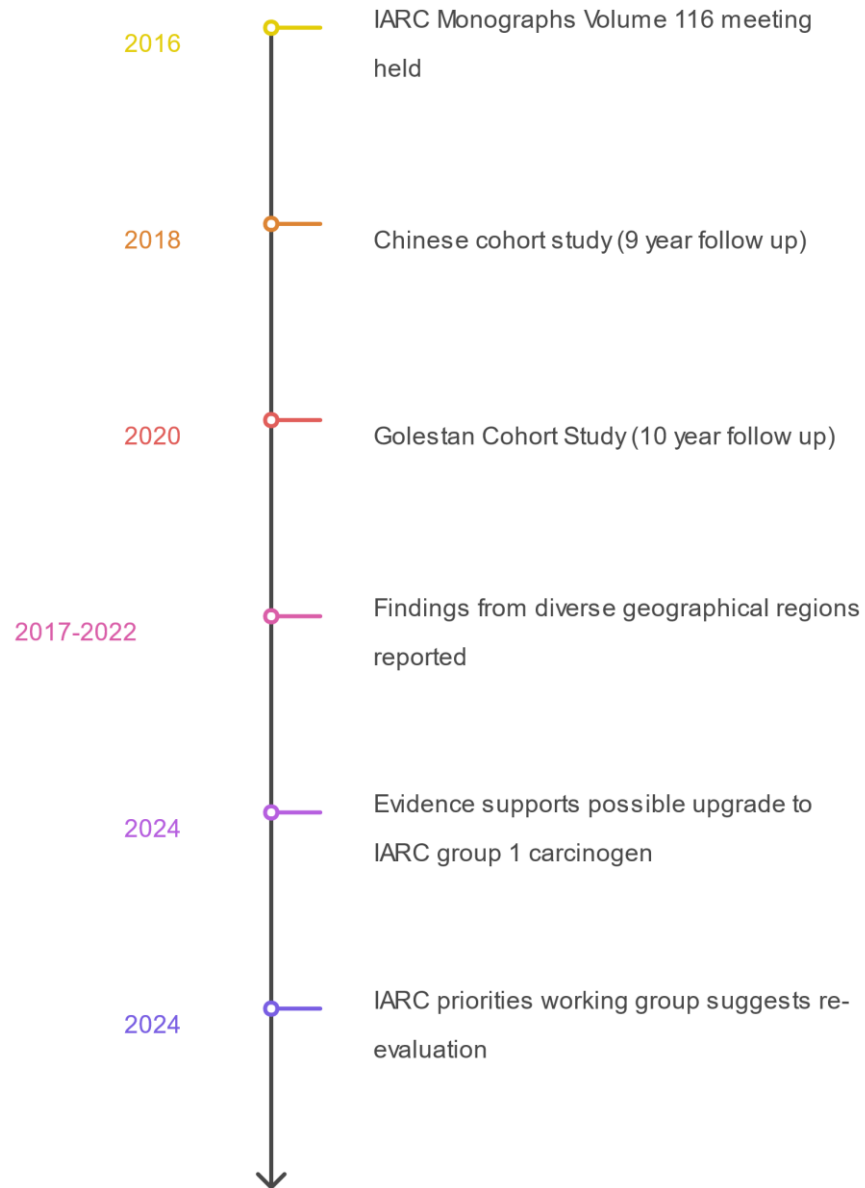
Very hot beverages at above 65°C: probably carcinogenic to humans (Group 2A)

Epidemiology

Tea drinkers. 300 cases with oesophageal squamous cell carcinoma and 571 matched controls, in Golestan, northern Iran, 2003-7

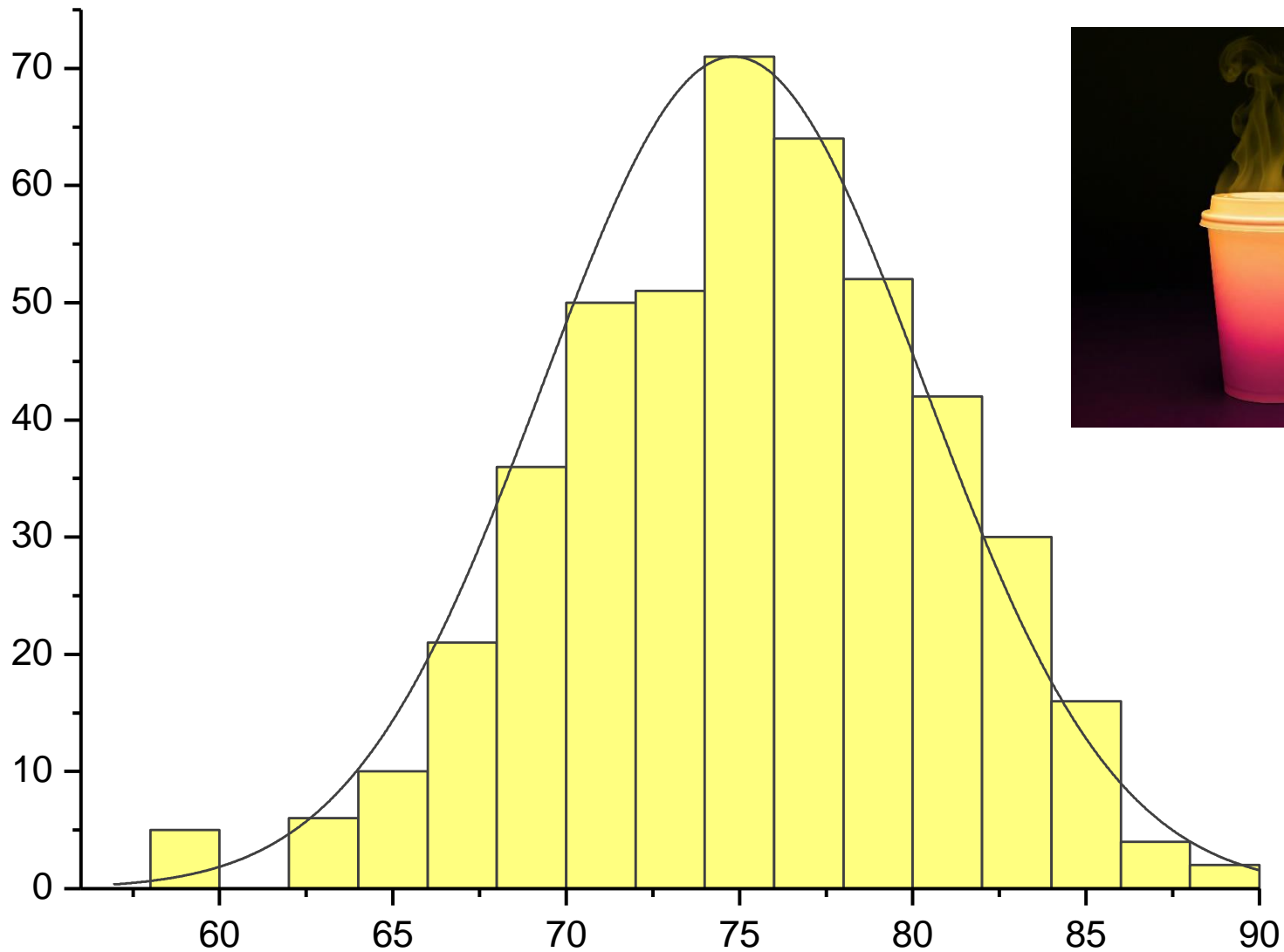
	Adjusted odds ratio (95% CI)
Warm or lukewarm	1.00
Hot	2.07 (1.28 to 3.35)
Very hot	8.16 (3.93 to 16.91)

Increased ESCC Risk from Hot Beverages



Why is this relevant for coffee?

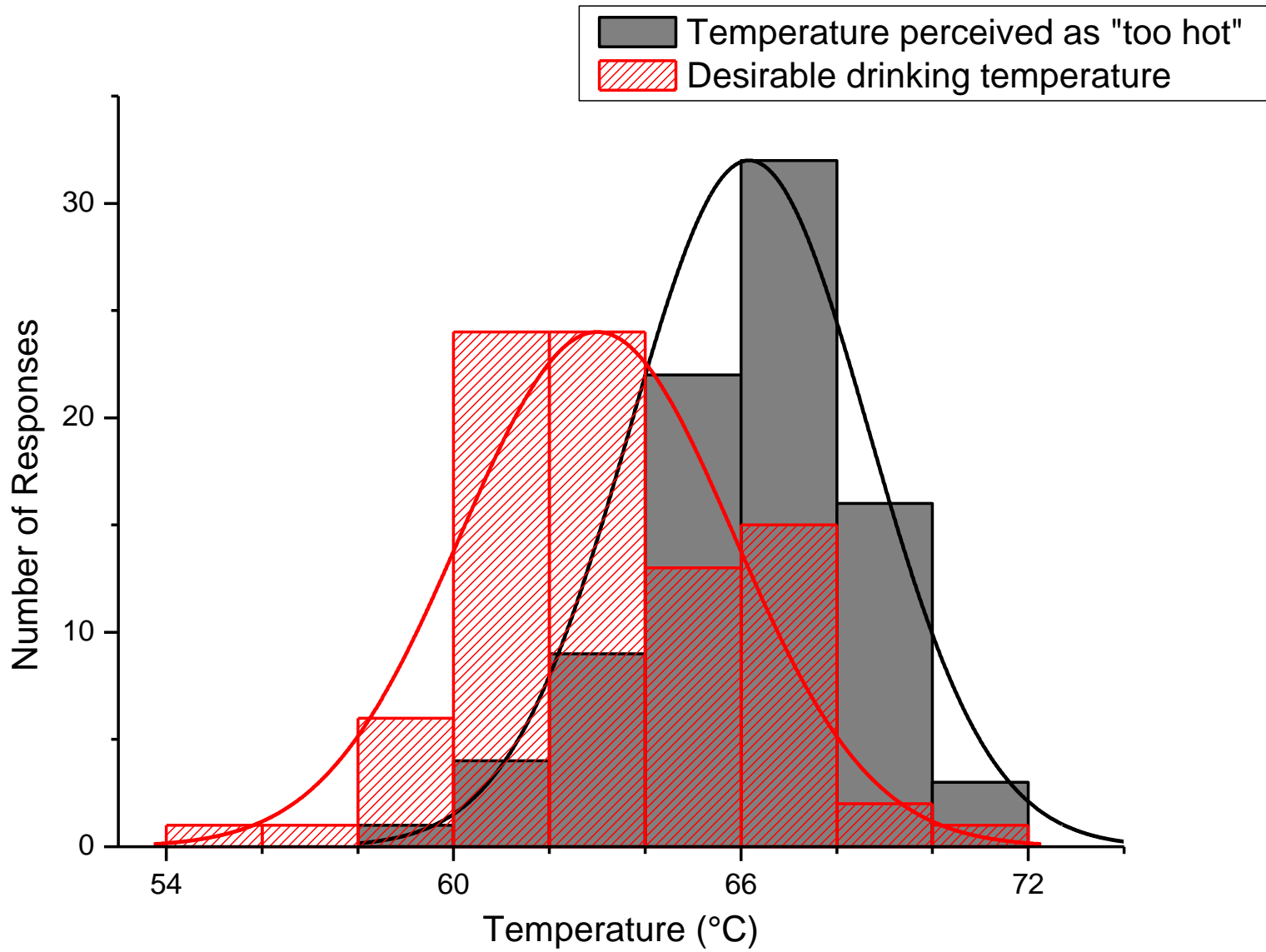




Serving temperature [°C] of coffee in households and gastronomy (n=460)



Dirler et al. (2018) Foods, 7(6), 83.



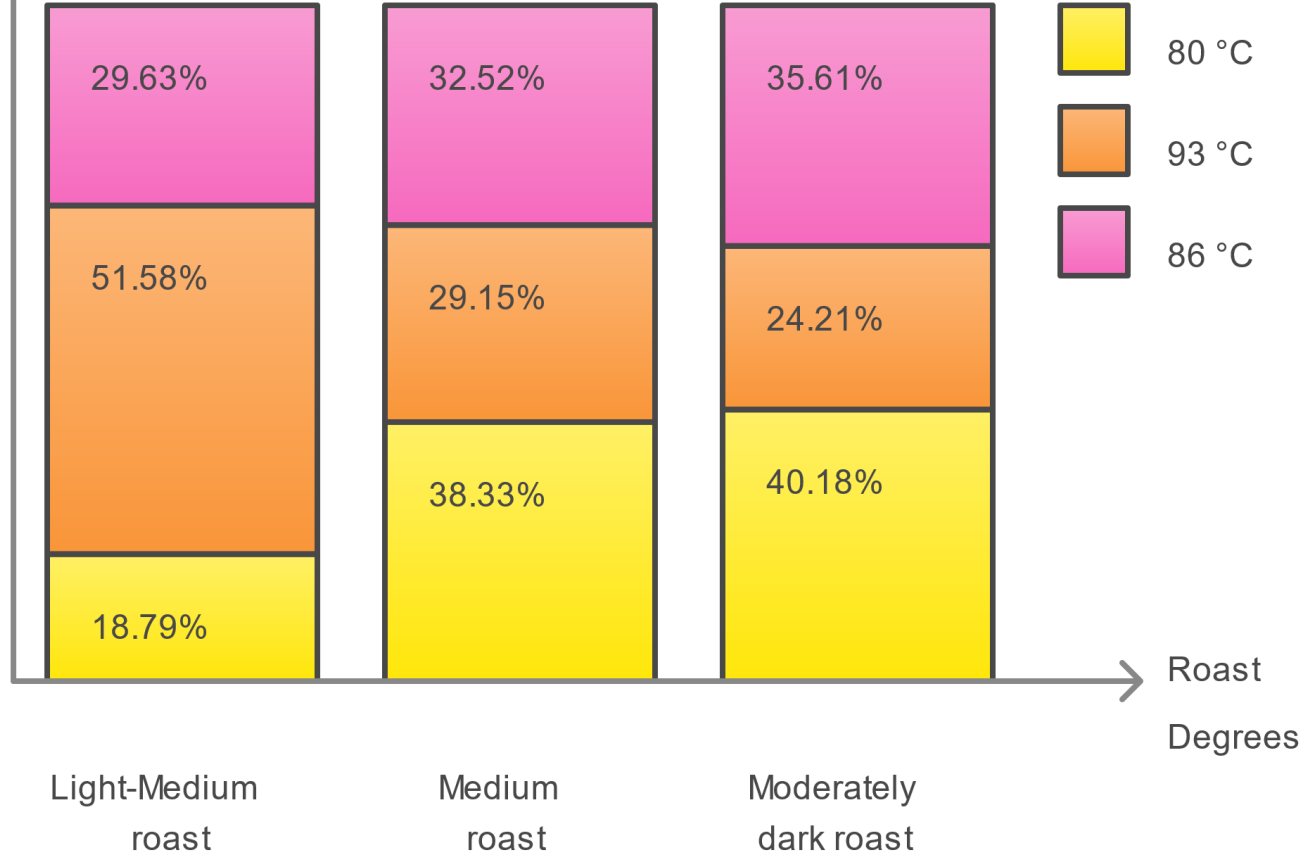
Previous experiments

- Cuptasting: identically brewed coffee at 62°C, 54°C and 45°C
- Highest temperature: taste not perceptible at all (feedback from pain receptors masks taste buds)
- 54°C: clearly more acidic and fruity. The best flavor profile at the lowest temperature, with clear acidity and sweetness and pronounced body, a dramatic difference to the high temperature.
- Explanation: when cupped at 45°C, the coffee is at about body temperature in the mouth

Results

Preference

(%)

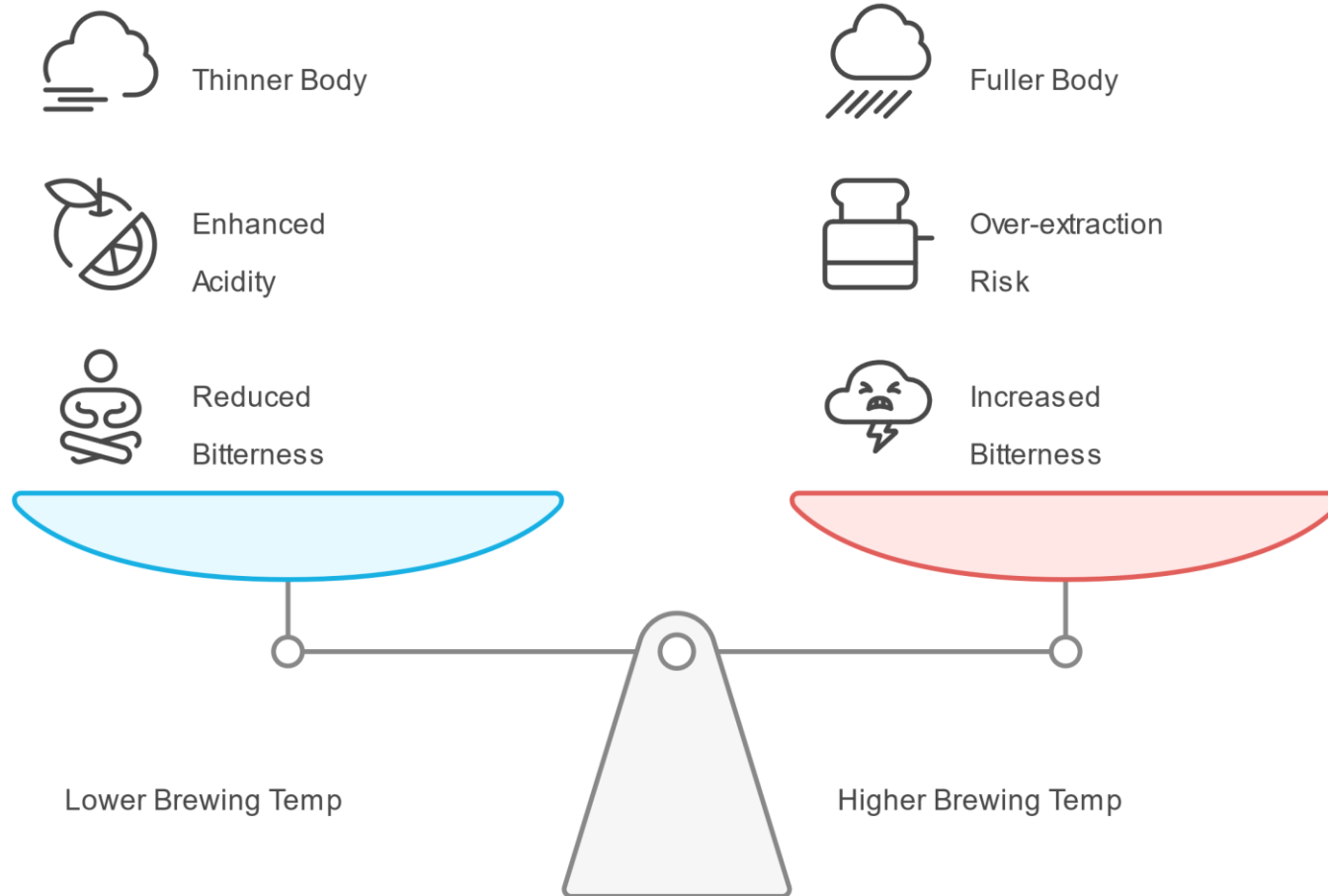


Sensory Profile Comparison of Coffee

Brews at Different Temperatures



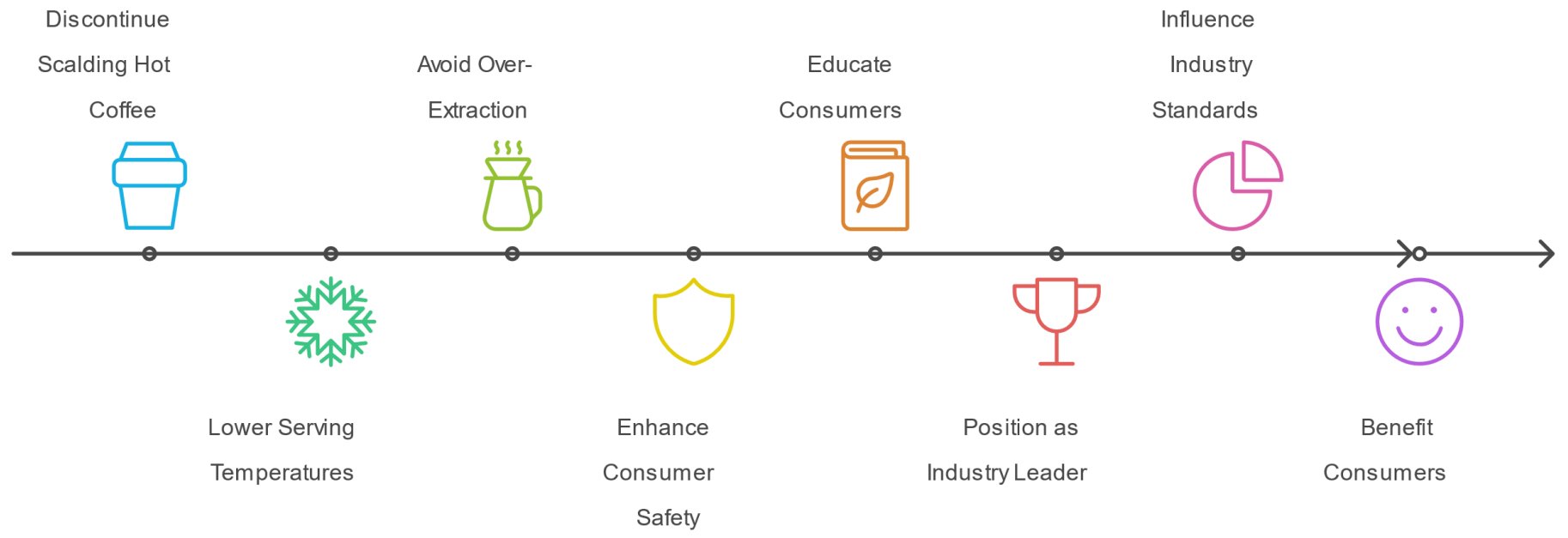
The flavor balance of brew temp.



Balancing coffee flavor through brewing temperature.



Brewing a Healthier Cup: A Step-by-Step Guide



Conclusions

- Evidence linking very hot beverage consumption to increased esophageal squamous cell carcinoma (ESCC) risk has strengthened
- This highlights the need to reassess coffee brewing and serving practices
- Assessors prefer coffee brewed at lower temperatures as the roasting degree increases
- Further investigation is needed into:
 - How different temperatures affect extraction of specific compounds in coffee
 - Impact of extraction temperature on taste and aroma



Thank you very much!

Contact: Dirk.Lachenmeier@cvuaka.bwl.de

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Picture sources:

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