

## A CASE OF SENSORIAL ANALYSIS: PROPENSITY TOWARDS RISKY EDIBLES IN CHILDHOOD

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### Abstract

*Aims of my experience is to demonstrate that naïve and unsophisticated children prefer always to eat food containing elevated percentages of acrylamide, and for, I recruited 18 children using to play in the public gardens in the afternoon, which voluntarily have accepted to taste diverse types of hash browns served at a kiosk close to the gardens. All the protocols concerning the experimental researches on minors have been registered and encoded and sent to the appointed Cabinets at the Ministries of Health and of Social Politics to Rome and moreover have been compiled following chiefly the commas of the Declaration of Helsinki and peculiarly the amendments recorded in the second revision of Venice (1983) and the notes on article num. 29 (Washington Clarification) of the Fifth Revision of Edinburgh (2000), all dealing with the bioethics on experiments upon minors, as well as obsequiously with regards to the report "Confidential Care for Minors" issued April 1994, updated June 1996 and finally to the report "Amendment to Opinion E-5.055" updated November 2013. The amazing results manifest that it must be reputed mandatory to assert that the adage "Everything you like is bad for you", which follows the Murphy's food laws, seems to jibe to my hypothesis: idest uncorrupted senses are prone to choose artificial flavours that tend to gratify palatability and gust although are devastating and risky for Human Health and this concern is valid for all chemical colorants, additives and seasonings.*

**Keywords:** *Grewia carpinifolia*, proximate analysis, minerals, anti-nutritional contents

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## 1. INTRODUCTION

Since the initial discovery of acrylamide in food by the Swedish Food Authority in 2002, research on the formation of acrylamide in all imaginable type of food to determine their levels and thus their potential implications for health has continued strenuously everywhere. (Bongers ML et al. 2012, Hogervorst JG et al. 2009, Hogervorst JG et al. 2008, Hogervorst JG et al. 2009, Larsson SC et al. 2009a, Larsson SC et al. 2008, Larsson SC et al. 2009b, Larsson SC, et al. 2009c, Larsson SC et al. 2009d, Mucci LA et al. 2009, Mucci LA et al. 2003, Mucci LA et al. 2005, Schouten LJ, et al. 2009, Wilson KM et al. 2012, Wilson KM et al. 2009). Acrylamide is formed during the Maillard reaction. Products of the Maillard reaction are responsible for much of the flavour and colour associated with fried, roasted and baked foods, and it is axiomatic that the

aforesaid products are unequivocally tasty and savoured. This reaction requires sugars, proteins (or free amino acid, preferably asparagine, glutamine, lysine, arginine, methionine, cysteine, alanine, glycine and histidine) and high temperatures to proceed. In presence of acrolein, deriving from thermal degradation of the glycerol contained in all kinds of greases and oil.

When 1g of asparagine undergoes to the process of baking for 30 min in presence of acrolein emanated from fatty acids contained in fats, greases or vegetal oils, develops 1675 $\mu$ g of acrylamide, 1 g of glutamine gives raise to 1566  $\mu$ g of acrylamide meanwhile lysine to 1553, arginine to 893, methionine to 419, cysteine to 221, alanyne to 203, glycine to 150, histidine to 256)(23).

It is validated that arginine, lysine and glutamine delivers more acrylamide than all the other aminoacids since they contain two nitro-groups in their chain.

Cooking methods such as frying, baking, broiling, or roasting are more likely to produce acrylamide, while boiling, steaming, and microwaving appear less likely to do so.

Acrylamide is found mainly in foods made from plants, such as potato products, grain products, or coffee.

Acrylamide does not form (or forms at lower levels) in dairy, meat, and fish products.

It is substantiated too that the smoke point of the fat, grease or oil employed for baking, roasting or frying is determining for the production of acrylamide.

As a rule, vegetable-based oils have higher smoke points than animal-based fats like butter or lard. The main exceptions are hydrogenated vegetable shortening, which has a lower smoke point than butter, and olive oil, which has a smoke point about equal to that of lard.

Another factor is the degree of refinement of a given oil. The more refined an oil, the higher the smoke point. That's because refining removes the impurities that can cause the oil to smoke. A simple rule of thumb is that the lighter the colour of the oil, the higher its smoke point.

Finally, it's important to note that any given oil's smoke point does not remain constant over time. The longer an oil is exposed to heat, the lower its smoke point becomes.

A huge avalanche of papers and reviews is available, to prescribe all the possible strategies and chemical-physical expedients in order to have the minimum production of acrylamide by roasting, baking or frying food containing aminoacids and carbohydrates.

Notwithstanding, it is mandatory to assert that in this case, the adage "Everything you like is bad for you", which follows the Murphy's food laws, seems to jibe to my hypothesis: idest uncorrupted senses are prone to choose artificial flavours that tend to gratify palatability and gust although are devastating and risky for Human Health and this concern

is valid for all chemical colorants, additives and seasonings.

Aims of my experience is to demonstrate that naïve and unsophisticated children prefer always to eat food containing elevated percentages of acrylamide, and I recruited 18 children using to play in the public gardens in the afternoon, which voluntarily have accepted to taste diverse types of hash browns served at a kiosk close to the gardens.

All the protocols concerning the experimental researches on minors have been registered and encoded and sent to the appointed Cabinets at the Ministries of Health and of Social Politics to Rome and moreover have been compiled following chiefly the commas of the Declaration of Helsinki and peculiarly the amendments recorded in the second revision of Venice (1983) and the notes on article num. 29 (Washington Clarification) of the Fifth Revision of Edinburgh (2000), all dealing with the bioethics on experiments upon minors, as well as obsequiously with regards to the report "Confidential Care for Minors" issued April 1994, updated June 1996 and finally to the report "Amendment to Opinion E-5.055" updated November 2013.

Hashes browns were prepared following different procedures and using different potatoes and oils for frying those.

## **2. MATERIAL AND METHODS**

For my experiments I have decided to let the 18 children be helped with hash browns made up with three different type of potatoes, a starchy one (the Russet), a waxy one (the Rose Finn Apple) and a red-all-purpose one (the Red Gold, that is a kind of potato extremely poor in starch) and fried using three kinds of vegetable-based oils, belonging respectively to the category of low-cooking-oils (smoke point 83-110°C), medium-cooking-oils (110-175°F) and deep-cooking-oils (175-235°F) and so, harsh browns were fried in:

- a) Extra virgin olive oil that possesses a smoke point 191°C
- b) Olive oil Pomace that possesses a smoke point 238°C

**Table 1. The quantities of acrylamide ( $\mu\text{g}/\text{hg}$  of food)**

Type of Hash brown	<i>quantity of acrylamide (<math>\mu\text{g}/\text{hg}</math>)</i> Extra virgin olive oil	<i>quantity of acrylamide (<math>\mu\text{g}/\text{hg}</math>)</i> Oil of Pomace	<i>quantity of acrylamide (<math>\mu\text{g}/\text{hg}</math>)</i> Avocado oil
A) Hash browns made with Russet potatoes	480	280	140
B) Hash browns made with Ross Finn apple potatoes	270	160	110
C) Hash brown made with Red gold potatoes	230	140	90

**Table 2. Degree of palatability and satisfaction in tasting Russet Hash brown fried by diverse oils characterised by different smoke point**

Volunteer	Russet Hash brown fried in Extra Virgin Olive oil	Russet Hash brown fried in Olive oil of Pomace	Russet Hash brown fried in Avocado oil
$\alpha$	9	6	3
$\beta$	7	6	2
$\gamma$	8	7	1
$\delta$	7	6	3
$\varepsilon$	5	5	5
$\zeta$	9	5	2
$\eta$	8	6	2
$\theta$	7	7	2
$\iota$	7	5	4
$\kappa$	7	4	2
$\lambda$	8	6	1
$\mu$	9	6	2
$\nu$	9	6	3
$\xi$	6	7	2
$\circ$	8	6	4
$\pi$	9	7	1
$\rho$	2	6	9
$\varsigma$	8	6	2

c) Avocado oil that possesses a smoke point 271°C.

Presently, these are the 9 types of Hash browns served at the kiosk at the public garden where children use to play:

a) Hash brown made with mashed Russet (starched potato) fried in Extra virgin olive oil

b) Hash brown made with mashed Russet (starched potato) fried in Olive oil of Pomace

c) Hash brown made with mashed Russet (starched potato) fried in Avocado oil

d) Hash brown made with mashed Rose Finn Apple (waxy potato) fried in Extra Virgin olive oil

- e) Hash brown made with mashed Rose Finn Apple (waxy potato) fried in Olive oil of Pomace
- f) Hash brown made with mashed Rose Finn Apple (waxy potato) fried in Avocado oil
- g) Hash brown made with mashed Red Gold (red-all-purpose potato) fried in Extra Virgin olive oil
- h) Hash brown made with mashed Red Gold (red-all-purpose potato) fried in Olive oil of Pomace
- i) Hash brown made with mashed Red Gold (red-all-purpose potato) fried in Avocado oil

It must be kept on account that all types of Hash browns have to be fried for 4 minutes in hot oil at 270°C.

Speaking with the relatives of the single teenagers of the public garden, in order to draw

up the eventual clinical histories of the children, two cases are to be highlighted: Case ε suffers from ageusia due to the Gougerot-Sjögren's syndrome and Case ρ suffers from dysgeusia due to a severe mycosis of the buccal mucosa and these two malaises should interfere with taste and perception.

In Table 1 the quantities of acrylamide ( $\mu\text{g}/\text{hg}$  of food) are scored with regard to the diverse oil employed for frying.

### 3. RESULTS AND DISCUSSION

The following three Tables (2, 3, and 4) validate my original hypothesis that will be discussed below.

**Table 3. Degree of palatability and satisfaction in tasting Rose Finn Apple Hash brown fried by diverse oils characterised by different smoke point**

Volunteer	Rose Finn Apple Hash fried in Extra Virgin olive oil	Rose Finn Apple Hash fried in Olive oil of Pomace	Rose Finn Apple Hash Fried in Avocado oil
α	7	4	2
β	6	5	2
γ	5	5	1
δ	6	4	2
ε	5	3	3
ζ	6	3	1
η	7	4	1
θ	5	5	1
ι	6	4	2
κ	6	4	1
λ	6	3	1
μ	7	5	2
ν	6	4	2
ξ	5	4	1
ο	6	3	2
π	5	5	1
ρ	2	4	7
ς	6	4	2

**Table 4. Degree of palatability and satisfaction in tasting Red Gold Hash brown fried by diverse oils characterised by different smoke point**

Volunteer	Red Gold Hash brown fried in Extra Virgin olive oil	Red Gold Hash brown fried in Olive oil of Pomace	Red Gold Hash brown fried in Avocado oil
α	5	3	2
β	6	3	1
γ	5	4	1
δ	4	3	1
ε	5	3	2
ζ	4	2	1
η	5	2	1
θ	6	3	1
ι	5	2	1
κ	5	3	0
λ	4	2	1
μ	5	4	1
ν	5	3	2
ξ	4	4	1
ο	5	3	2
π	3	4	1
ρ	3	5	3
ς	5	3	1

It is fully unequivocal that almost all volunteers (as I cited before, children endowed by a naïve and unsophisticated propensity to good palatability), 16 individuals, prefer always food that has been fried using vegetal oil characterised by a low smoke point, that is they all favour the hazardous edibles, as the aforesaid food is rich in acrylamide.

It is relevant the fact that the two cases of ageusia (ε) and dysgeusia (ρ) perceive all sensations distorted, and it clarifies my initial hypothesis that is the lack of finesse and sophistry the prime cause of acceptation of risky edibles and even that the same lack of finesse and sophistry may result severely prejudicial in sensorial analysis especially when food and children are involved.

#### 4. CONCLUSIONS

I deem the best way to exorcise these types of attacks of Human health could be to signal the possibility of giving false anticipations and risks of disease insurgence in some groceries

expressly dedicated to childhood, as gamble is signalled as spring of psychopathological addiction or tobacco dependence as source of cancer of diverse malaises.

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