KUTAS FOOD GROUP

ECONOMIC ADULTERATION in HERBS & SPICES

INTRODUCING ECONOMIC ADULTERATION

•Adulteration of food ingredients is a major problem for Food Manufacturers who need to ensure that high quality correctly labelled food products are available to the final consumer.

• Herbs & Spices have been an international trading item for thousands of years and traditionally they were cleaned and sorted into a final product at the destination countries.

•Although, the destination countries now have the benefit of acquiring the final product at a lower cost, the product is no longer in its natural form; therefore, control of pureness is not
easily observed.

•Production of Herbs & Spices at source has become a specialised field and manufacturers have saturated this popular market.

• Price competition especially has brought about the formulation of low-grade mixtures.

• These low qualities are sometimes obtained by “well-prepared” pure blends of spent (exhausted) material or by including relatively low cost non-characteristic ingredients (adulteration).

INTRODUCING ECONOMIC ADULTERATION

In Europe we may see a different definition to adulteration than in the USA.

We differentiate between:

Adulteration – "The deliberate adding of a component that should not be present"

and

Contamination – "The presence of an undesirable substance"

We would say:

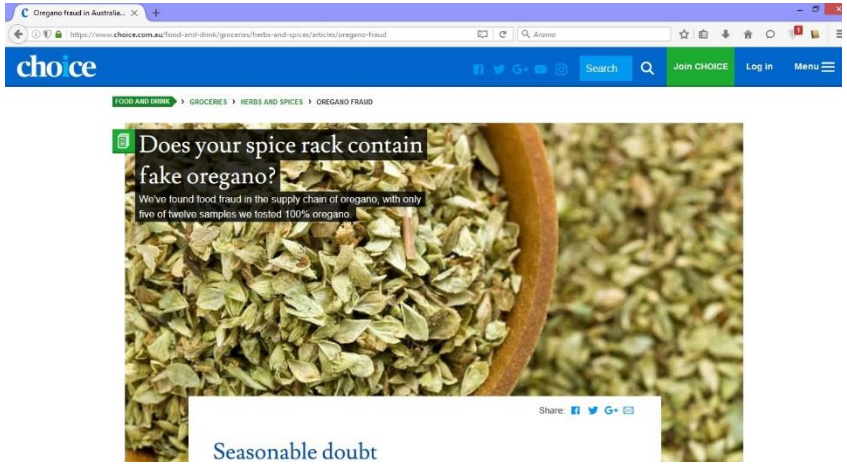
“adding flour, artificial colour, spent meal” is **Adulteration**

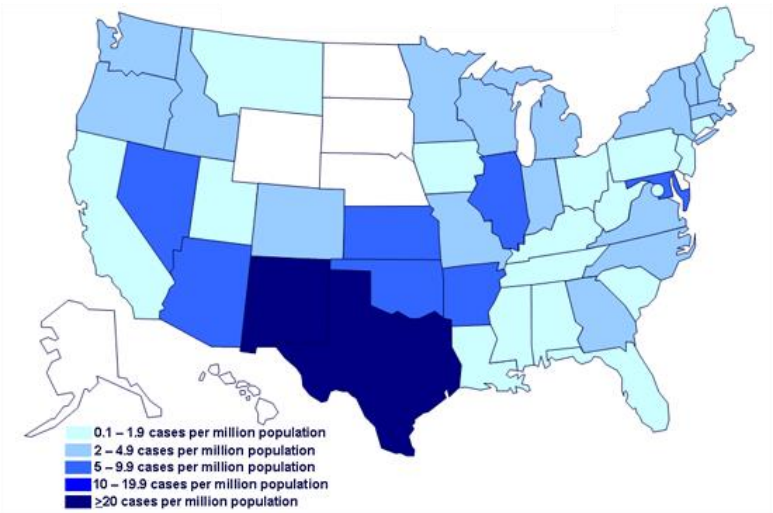
and

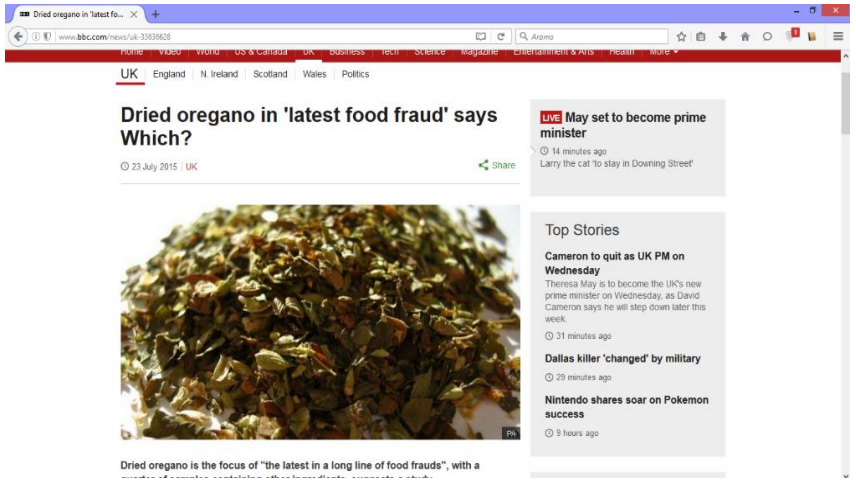
“the presence of salmonella, heavy metals, aflatoxin’’ is **Contamination**

KUTAS and FIGHT AGAINST ADULTERATION

- Rising awareness amongst customers following food scandals in UK (oregano), Australia (oregano), UK (horse meat), US (peanut in cumin), Denmark (oregano)







KUTAS and FIGHT AGAINST ADULTERATION

- Since its foundation, Kutas Group is committed to supplying 100% PURE, unadulterated products to its customers.

- With the implementation of FSMA in the US, there is growing awareness for adulteration Worldwide. Importers are now held directly responsible for undeclared material in their products

- Codex efforts, re-writing the rules! Kutas co-chairs World Food Codex Herbs Committee.
- Draft proposal includes specific section for purity and will state «Dried culinary herbs shall be free from any economic adulteration.» (Section 3.2.2 on Adulteration)

CODEX ALIMENTARIUS
International Food Standards

efsa
European Food Safety Authority

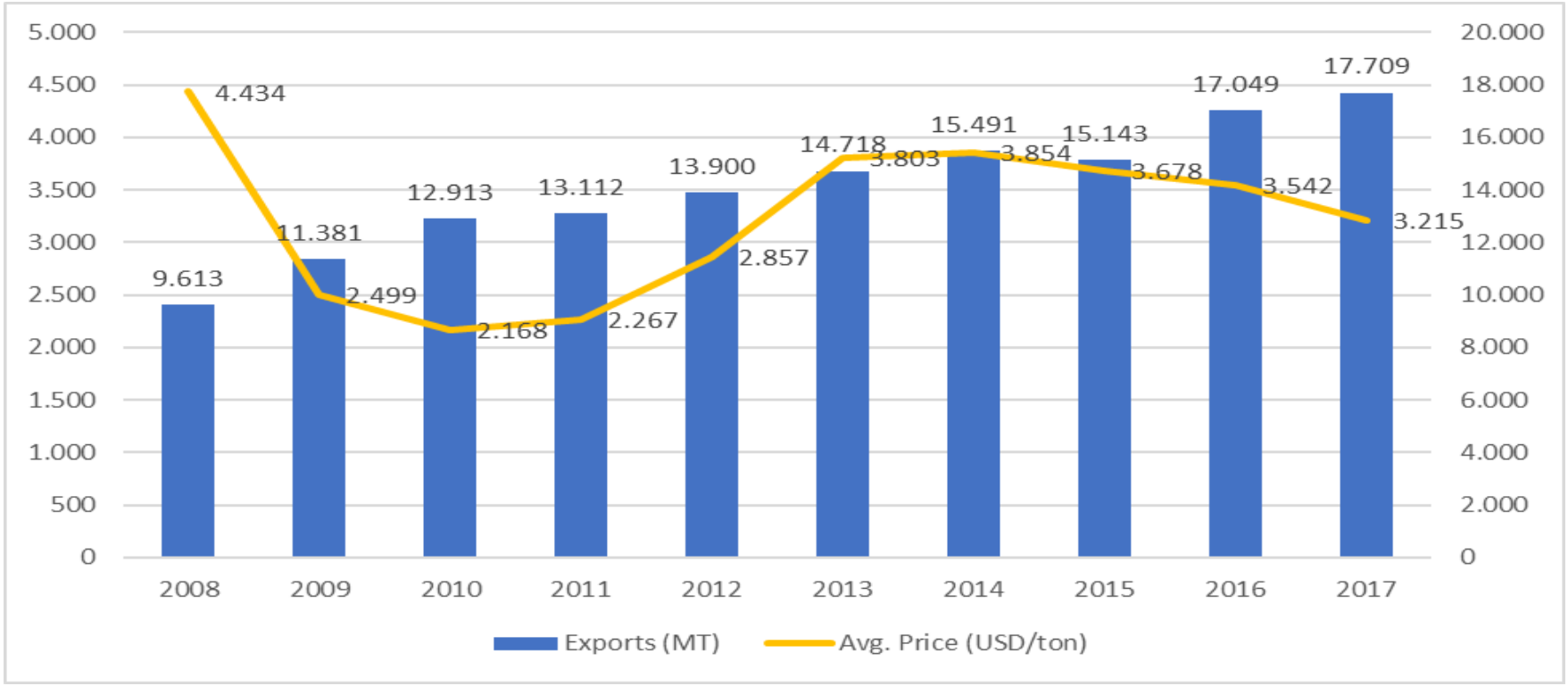
FDA FOOD SAFETY MODERNIZATION ACT

内閣府 食品安全委員会
Food Safety Commission of Japan

WHY DO PEOPLE ADULTERATE ?

Turkey produces app. 10-12,000 MT of oregano raw material. This equals app. 7,-8,000 MT of final product. Kutas exports app. 50% of Turkish total.

Past 10 years data shows how dangerous the trend has become.



WHY DO PEOPLE ADULTERATE ?

- **Common industry specifications allow maneuver room for companies adulterating their products.**

Adulteration in Oregano, a Numerical Exercise

Adulterant	VO Level	Oregano Base Price	Adulterant Base Price	Final Product Cost
0%	3,10%	100	60	100
10%	2,79%	100	60	94
20%	2,48%	100	60	88
30%	2,17%	100	60	83
35%	2,02%	100	60	79
40%	1,86%	100	60	76
50%	1,55%	100	60	70
60%	1,24%	100	60	65
70%	0,93%	100	60	59
80%	0,62%	100	60	53
90%	0,31%	100	60	47
100%	0,00%	100	60	41

Origanum Onites

- **Hairy look**
- **Oil droplets**

HOW TO IDENTIFY ADULTERATION?

Microscopic Analysis:

Mrytle Leaves:

- Wafer-like structure
- Oil droplets
- No hairs

Olive Leaves:

- Hairy structure
- No oil droplets
- Pesticide issue

Cistus Leaves:

- Hairy and woody structure
- No oil droplets

Sumac Leaves:

- Hairy and woody structure
- No oil droplets

DNA Analysis:

- Gaining rapid ground in US market. Multinationals adopting daily use for raw material acceptance and cross referencing.
- Still in its early days due to lack of catalogue and reference material for plants
- Labiatae genus (flowering and aromatic plants) analysis is very accurate, wild result variation in other plants.

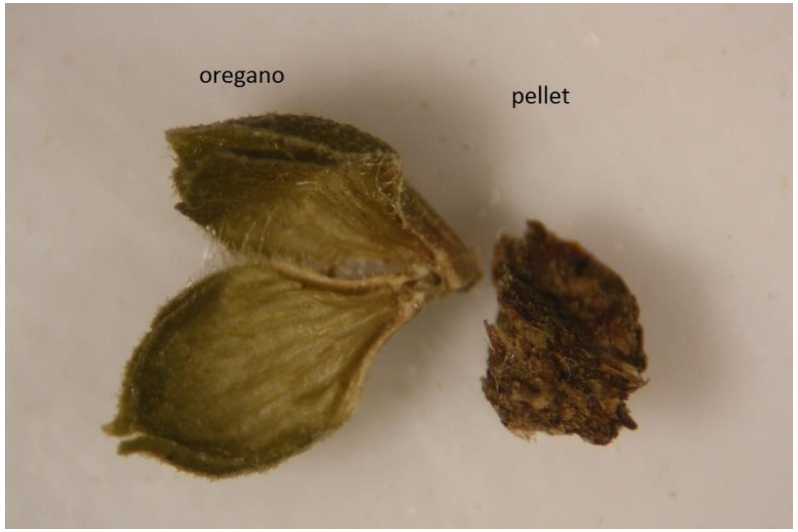
HOW TO IDENTIFY ADULTERATION?

GC Analysis

Essential Oil Compounds	Origanum Onites	Myrtle Leaves	Origanum Onits/Myrtle Leaves Blend (50:50)	Cistus	Origanum Onits/Cistus Leaves Blend (50:50)	Sumac Leaves	Origanum Onites/Sumac Blend (50:50)
α-Thujene	0,40	0,00	0,00	0,00	0,00	0,00	0,00
α-Pinene	0,00	***34,02***	***5,14***	0,00	0,00	1,75	0,00
Myrcene (β-Myrcene)	0,52	0,00	0,00	0,00	0,00	0,00	0,00
α-Terpinene	0,55	0,00	0,00	0,00	0,36	0,00	0,44
p-Cymene	1,85	0,00	1,06	0,00	1,72	1,31	1,22
Limonene (DL-Limonene)	0,00	***6,46***	0,00	0,00	0,00	0,00	0,00
1,8-Cineole	0,00	***17,32***	***12,60***	0,00	0,00	***9,66***	0,81
γ-Terpinene (gamma-Terpinene)	3,18	0,00	1,28	0,00	1,67	0,00	2,06
Linalool	2,61	***8,28***	3,26	0,00	1,80	3,37	2,59
α-Thujone	0,00	0,00	0,00	0,00	0,00	1,36	0,00
Camphor	0,00	0,00	0,00	0,00	0,00	1,66	0,00
Borneol	1,28	0,00	1,01	0,00	1,52	***9,32***	1,53
Terpinen-4-ol	0,77	0,00	0,66	0,00	0,73	1,31	0,85
α-Terpineol	0,00	3,58	1,55	0,00	0,00	***5,48***	0,00
Linalyl acetate	0,00	4,02	0,00	0,00	0,00	0,00	0,00
Thymol	1,84	0,00	0,63	2,23	3,41	***9,86***	1,17
Carvacrol	***84,82***	0,00	***71,02***	0,00	***86,58***	***36,00***	***87,56***
Myrtenyl acetate	0,00	***10,93***	0,00	0,00	0,00	0,00	0,00
α-Terpinenyl acetate	0,00	1,05	0,00	0,00	0,00	1,29	0,00
Nerol acetate	0,00	1,13	0,00	0,00	0,00	0,00	0,00
Caryophyllene	0,85	0,00	0,43	0,00	0,53	4,08	0,64
Humulene (α-Humulene)	0,00	1,01	0,00	0,00	0,00	1,11	0,00
β-Bisabolene	1,35	0,00	0,76	0,00	0,88	1,25	1,13
L-calamenene	0,00	0,00	0,00	1,49	0,00	0,00	0,00
α-Caryophyllenol	0,00	0,00	0,00	0,00	0,00	1,62	0,00
Cadine-1,4-diene	0,00	0,00	0,00	1,20	0,00	0,00	0,00
2-Pentadecanone, 6,10,14-trimeth	0,00	0,00	0,00	1,11	0,00	0,00	0,00
Sclareoloxide	0,00	0,00	0,00	1,16	0,00	0,00	0,00
Cembrene	0,00	0,00	0,00	0,00	0,00	1,09	0,00
Epimanoyl oxide	0,00	0,00	0,00	***28,83***	0,24	0,00	0,00
Manoyl oxide	0,00	0,00	0,00	***37,23***	0,27	0,00	0,00
1-Naphthalenol, 5,7-dimethoxy-	0,00	0,00	0,00	4,14	0,00	0,00	0,00

LATEST «TREND» in ADULTERATION - PELLETS

- Fines, stems and sort outs compressed with water
- High health risks, water used in production, machine oil contamination possibility
- Technically «oregano», DNA analysis ineffective
- Used for economic gains and BD adjustment for «perfect fill weight»
- Trained personnel and microscopic inspection only valid methods of identification



Final Words

- FSMA regulations AND World Food Codex discussions are bringing in «purity» as a primary criteria
- FSMA mandates that not only importers, but end users run programs to assure purity of their product
- DNA analysis is becoming more widespread, quantification needs adjustment to comply with industry
- Visual identification by trained technicians is still the most accurate, albeit time-consuming method for identification of adulterants
- Brand owners at potential risk, naming campaigns underway!

THANK YOU