

ASTA ANNUAL MEETING  
APRIL 17-20, 2005



# Adulteration

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# Economic Adulteration of Herbs & Spices

***Presented by: Kazım Gürel***  
***Date: 20th April 2005***  
***ASTA 2005 Annual Meeting***  
***Phoenix, AZ***

# Introducing Economic Adulteration

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This is intentional adulteration  
intended to confer  
an economic advantage.

# Introducing Economic Adulteration

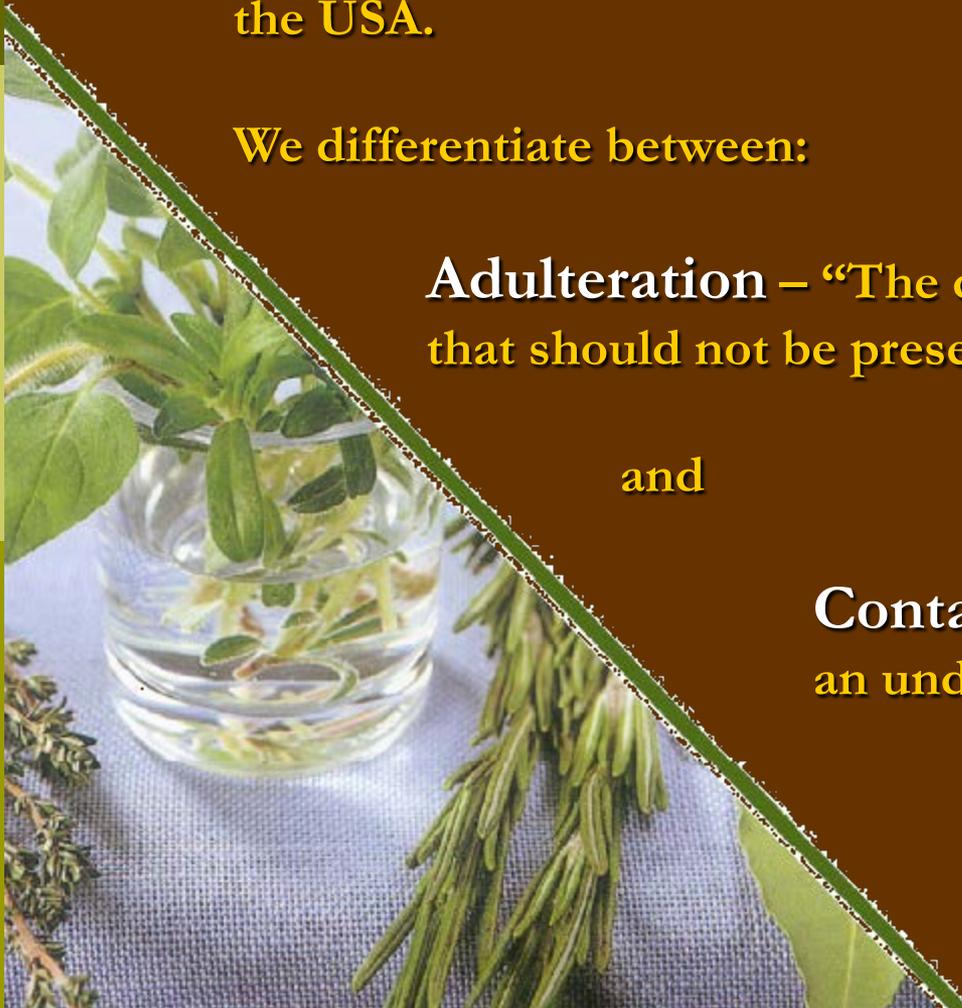
In Europe we have a different definition to adulteration than in the USA.

We differentiate between:

**Adulteration** – “The deliberate adding of a component that should not be present”

and

**Contamination** – “The presence of an undesirable substance”



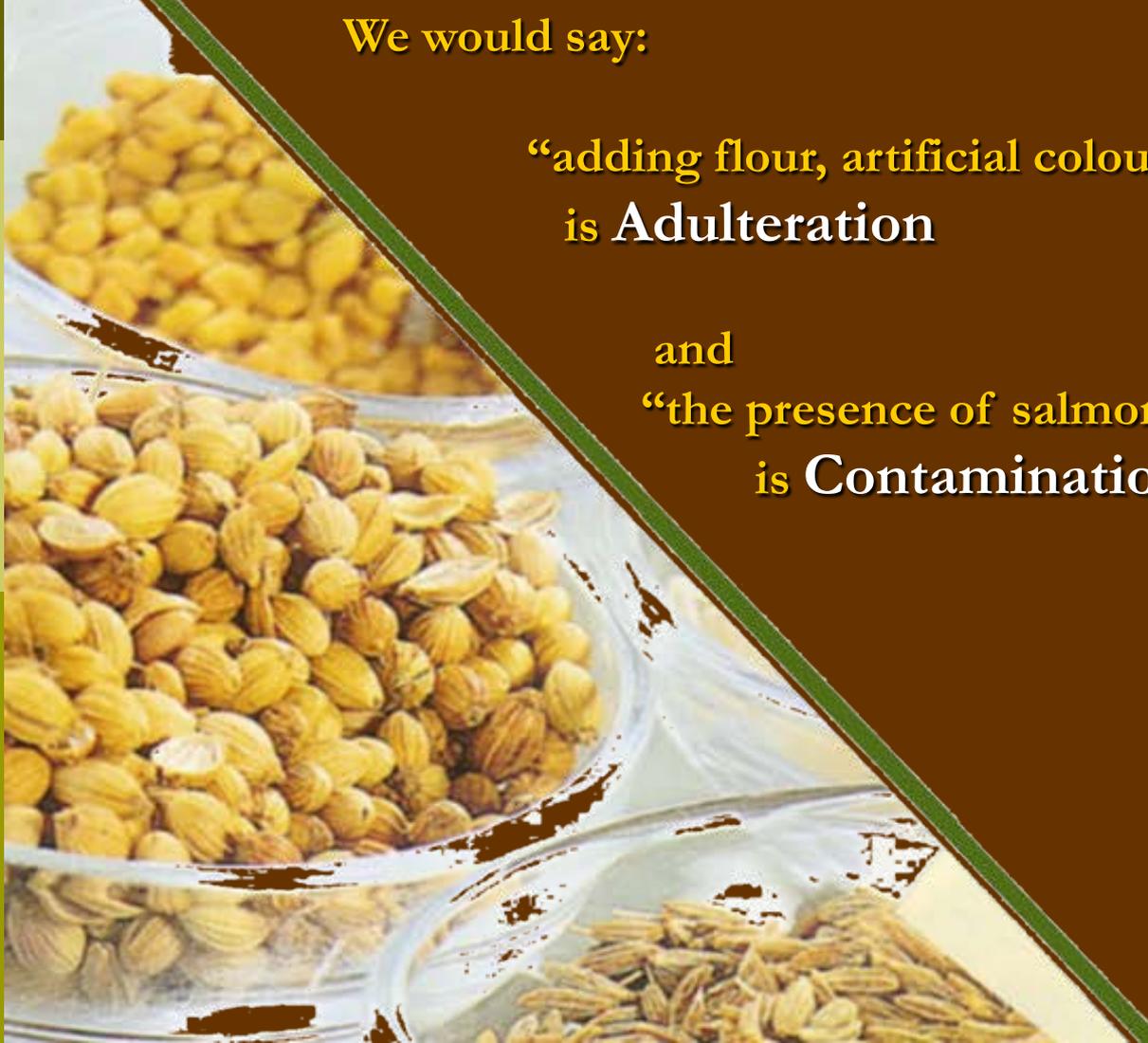
# Introducing Economic Adulteration

We would say:

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

and

“the presence of salmonella, heavy metals, aflatoxin”  
is Contamination



# Economic Adulteration

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. 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. Improved production technology in recent times has led to cleaning and sorting at source. Although, the destination countries have now 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.

# Economic Adulteration

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- Production of Herbs & Spices at source has become a specialised field and manufacturers have become crowded in this popular market.
- All Stages of Production are based on specifications and unfortunately not all specifications describe high qualities.
- 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).

# EU “Rapid Alert” System

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- The EU has introduced a “Rapid Alert” system which is designed to protect the consumer.
- Any Authority that finds a problem with a delivery of food material is obliged to enter the data onto the rapid alert data base.
- The details submitted are:
  - date
  - notifying country
  - product
  - problem
  - supplying country
- All of the data is put into a weekly report and distributed across Europe
- The EU parliament has also made the data available on the web.

# Economic Adulteration – Past Examples

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- **Black Pepper** – delivered from India, which upon arrival was cottonseed. The seed was easy to identify and also had no food safety risk.
- **Turmeric** delivered from India, which had been extended with flour and then had potassium chromate added to boost the colour.

# Paprika

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• Paprika manufactured in Hungary, which also had flour added and then Lead Oxide to boost the colour. Killed 2 people and hospitalised dozens.



# Chillies

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Then there was the recent Sudan in Chilli problem.

At present there are wide estimates of what the problem has cost the EU industry.

Figures of between \$500 million and \$800 million seem to be a reasonable Range.



# Sudan in Chillies

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- All Chilli based products now have to have a COA that shows the delivery has been tested for the Sudan compounds, otherwise it will be held whilst the analysis is done.
- The scale of the cost was affected by false positive analysis as when the problem was identified there was no suitable methodology.
- There were at least 50 false positive recalls of the product from the market place. This was material that had been in the EU for many months before the problem was detected and already in some ready meals.
- As the product as Chilli it went into a vast range of products.

# Sudan in Chillies

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- In an attempt to demonstrate that the authorities were protecting the consumer sampling increased dramatically and at various points within the supply chain.
- E.g. a consignment of sausage that was manufactured in Germany, found to contain Sudan 1 in Italy, was returned to Germany and then re-analysed by the German authorities only to be found Sudan free.
- Typical recall costs involved:
  - recall of actual product
  - claim for loss of profit
  - claim for compensation
  - disposal costs
  - air freight for replacement supply
  - handling charges

# Lessons to be learned from Sudan Case

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- An incident like this affects the whole industry not just the company involved. As the company “disappears” they do not undertake a product recall. No formal recall was made of the product and thus the recall was conducted in the public domain with consumer groups and media personnel “stoking the fire”.
- As a result the recall was at least 100 times more costly than if it had been managed at an early stage.
- There was no validated method for the problem in question.
- Whilst it is very expensive specific product recall insurance may be beneficial.

# Economic Adulteration – WHY???

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1. For more profit !
2. To be able to compete !
3. “Copy Cat Adulteration” To be able to stay in business !
4. Cost Cutting Pressure. “Market Driven”

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# Economic Adulteration – WHY???

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## 1. For more profit !

This is the simplest form – a product is adulterated with cheaper filler that is easily disguised in the main product to lower the cost to the manufacturer enhancing his margin.

# Economic Adulteration – WHY???

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## 2. To be able to compete !

This is a slightly different form – The manufacturer is not able to meet the quality criteria of the high end supplier and is not preferred as a result.

He then adulterates his product to create a lower price level that allows him to “compete” !

Buyers who are not aware of the adulteration think they are getting a great deal and since it is creating an advantage by helping to fuel sales sometimes they look the other way !

# Economic Adulteration – WHY???

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## 3. “Copy Cat Adulteration” To be able to stay in business !

When the market accepts the second case described previously the remaining players are obliged to also adulterate to be able to stay in business.

# Economic Adulteration – WHY???

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## 4. Cost Cutting Pressure ! “Market Driven”

When the customer begins to squeeze the supplier for ever more cost savings there comes a point when the supplier must either stop supplying as his margin becomes untenable or he may choose to adulterate the product to lower cost and maintain a workable margin.

An important point should be considered :- A lot of adulteration is very much MARKET DRIVEN – i.e. The demand on price cutting are so severe that producers can not make money unless they adulterate.

# Economic Adulteration & Unfair Trade

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Reliable & Honest suppliers are finding it very difficult to compete with unrealistic price levels that are the outcome of Adulteration.

In some cases the adulterant used makes the product more visually attractive than the pure herb or spice itself. This creates very subjective analysis of the Pure item when it comes to approval of quality by customers who find the adulterated material better in terms of visual appearance.

In the Case of Sudan many honest Indian Suppliers lost business as buyers sourced from other markets. Companies not involved with the adulteration had to test for these chemicals and in many cases their containers were found to be held up at the Ports.



**Origanum Onites**  
**Origanum Vulgare**

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**Most will be familiar with  
two commonly known species  
of Mediterranean Oregano**



# Origanum Species

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A wide range of Pure Oregano Species exists with various physical chemical properties.



# Origanum Species

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The pure oregano species also have subspecies again with differing properties. For this reason the physical appearance of Oregano does not have one single characteristic and it can be easily adulterated.

Volatile Oil is a characteristic property of Oregano

Under a microscope small droplets can be seen on the leaves.

The components of Oregano v.o. consists of Carvacrol and Thymol.

Raw Materials have an average v.o. content of 2.5% .

# Oregano Adulteration - Chernobyl

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- When the Chernobyl disaster occurred it had a devastating effect on leafy herbs and in particular on Oregano
- Since the majority of the crop was contaminated it was impossible to ship the material.
- Some people discovered that by bulking up the material with other goods such as Sumac it was possible to reduce the detectable levels of radiation.
- Since they were able to ship in a year when uncontaminated Oregano was not available and since no body was looking they were able to make very good margins.

# Oregano Adulteration - Chernobyl

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- **OLD HABITS DIE HARD**

The experience from the Chernobyl years was difficult to ignore and the addition of Sumac or other plants was repeated even when there was no longer a risk of contaminated material.

# Oregano Adulteration – Exports / M.Tons

	<b>TURKISH OREGANO EXPORTS M. Tons</b>
<b>1985/86</b>	<b>1.925</b>
<b>1990/91</b>	<b>2.261</b>
<b>1995/96</b>	<b>4.125</b>
<b>2000/01</b>	<b>6.655</b>
<b>2001/02</b>	<b>6.992</b>
<b>2002/03</b>	<b>6.292</b>
<b>2003/04</b>	<b>7.200</b>

Total world exports approx. 9500 MT  
in 2003/2004

- Turkey exports approx. 75% of this total
- During the last 3 years Turkish Oregano exports have on average stagnated compared to the increasing trend seen over previous years.

# Oregano Adulteration – How Much ??? \_

		RAW MATERIAL	EXPORTS
2003/2004	PURE OREGANO	7.500	4.500
	ADULTERATION	4.500	2.700
	<i>TOTAL</i>	12.000	7.200

- At max. only 7500 tons of Pure Oregano Raw Material is available in Turkey
- This is equivalent to 4500 tons of Processed Material
- Total Exports is 7200 tons ????
- Nearly 40% of Total Exports is Adulteration

# Sumac

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- Sumac is the leaf of the *Rhus coriaria*.
- The fruits of Sumac are used as a spice; however, the leaves have no commercial value as a food ingredient.



# Sumac

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- The use of Sumac is one of the oldest methods for the Adulteration of Oregano. When added it blends with the typical greenish/yellow colour which is typical to Med. Oregano. Also the Particle Size is more uniform.
- Sumac contains no volatile oil.
- Unfortunately, Sumac contains gallic acid and this substance destroys the intestinal flora if there is regular intake, leading to health problems.
- ASTA has developed analysis techniques for the determination of Sumac. Furthermore, strict rules and regulations exists for the control of this material in ingredients. This has restricted the use of Sumac in Oregano blends for exports of the US; however, it is still used in exports to Europe and other destinations.

# Cistus - Ladanum

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- The leaf of the *Cistus ladanifer* from the Cistaceae family.



# Cistus - Ladanum

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- The use of Cistus started after the ban of Sumac by ASTA.
- Cistus has a dark green colour, smooth leaf surface, soft fine hairs on the inner side of the leaf with a typical smell.
- The addition of Cistus gives a greatly enhanced uniformity of green colour to the Oregano and makes it far more pleasing to the eye than the genuine article.
- The fragrance originates from ladanum, a typical resin of Cistus.
- This material is normally used with a max. ratio of 30% in a blend since it can be easily determined from its smell with higher values.

# Myrtus communis

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This product looks like a miniture Laurel (Bay) Leaf.

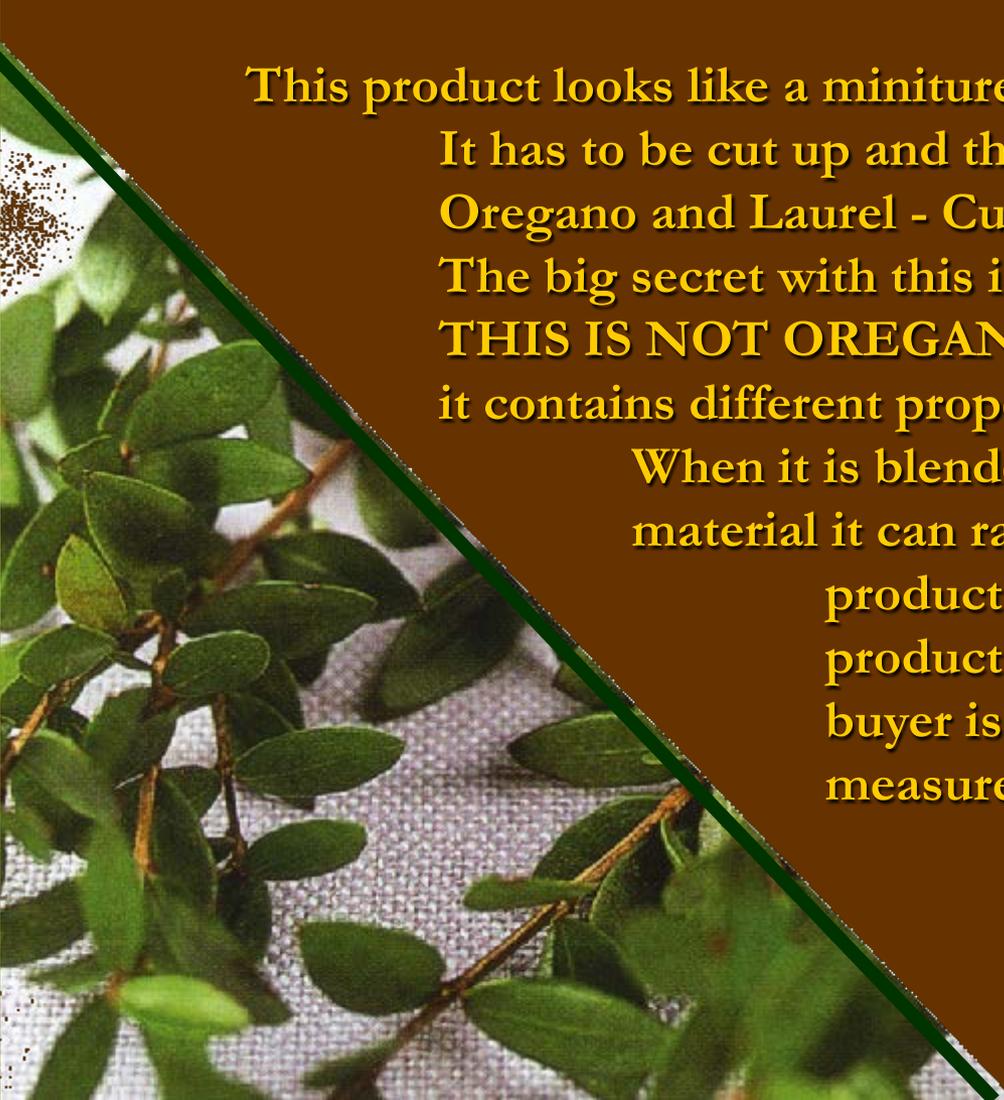
It has to be cut up and then it can be blended in to Oregano and Laurel - Cut and Ground.

The big secret with this is that it contains a volatile oil !

**THIS IS NOT OREGANO VOLATILE OIL**

it contains different properties.

When it is blended in to other already blended material it can raise the overall v.o. of the product and disguise the fact the product is in fact adulterated if the buyer is looking at oil content as a measure of adulteration.



# Wild Strawberry Tree Leaves

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The most recent addition to the stable of adulterants.  
When Sumac was banned by ASTA and Cistus became scarce,  
this was used as an alternative.

# Hazelnut Leaves

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- This is an adulterant we have discovered in Albania.
- The Oregano that grows in Albania is the VULGARE type which has a darker colour.
- Hazelnut Leaves blend in perfectly with this material and have a significant effect in increasing Albanian shippers margins in this product.



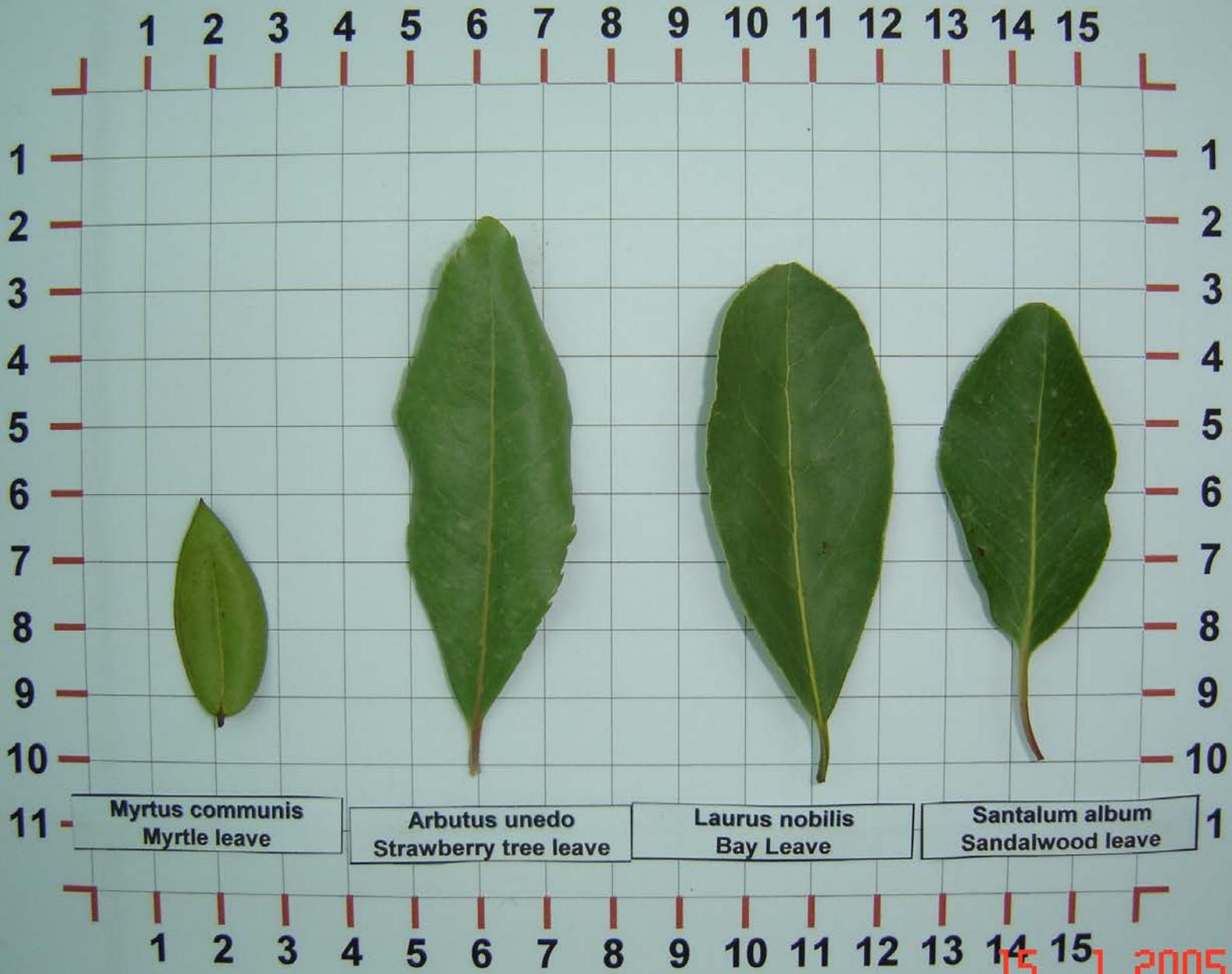
# Exhausted (Oil depleted) Leaves

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- Otherwise known as “Spent Material”
- Extracting Oregano oil has become increasingly fashionable in Turkey.
- The natural by-product when added to Oregano can either lead to that worthless by-product being sold at the price of Oregano or for the product it is added into to become that much cheaper and more “desirable” by the market looking for savings.

# (Bay) Laurel Leaves





15 1 2005

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 2005



Myrtus communis  
Myrtle leaf





15 1 2005



Laurus nobilis  
Bay Leaf

Myrtus communis  
Myrtle leaf

15 1 2005

# Economic Adulteration – Regulation ?

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- Create Awareness to Consumers & Importers
- Cooperate with the relevant Authorities in Key Source Countries to establish some form of Export Control.
- Establish test methods for Major Items. There are existing methods for identification of some adulterants; however, these can only be used if the adulterant material is known. Therefore, not to detect adulterants but to detect “PURENESS” as type of adulterants used change frequently. As one is detected another one is adopted.

# Economic Adulteration – Regulation ?

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- **The US Food Industry has been incredibly lucky that there have not been more major Food Scares or Major Recalls that have occurred due to Adulteration of Herbs & Spices.**

- Since the FDA is primarily interested in enforcement if a Safety issue is present this topic has not appeared on the FDA's radar screen.

- **There are good reasons for the Food Industry to take a closer look at this topic as the Industry's Reputation is at Stake.**

- e.g. Snow Brand Case in Japan

- The Consumer can contact the media instead of the relevant Authorities.

- Potential for Major Public Health Problem



# Economic Adulteration

“There is hardly anything in the world that some man cannot make a little worse and sell a little cheaper, and the people who consider price only are this man’s lawful prey” *John Ruskin*

If it looks too good to be true;  
it probably is!

“*Caveat Emptor*”

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**THANK YOU!**

**KAZIM GUREL**

# QUESTIONS

