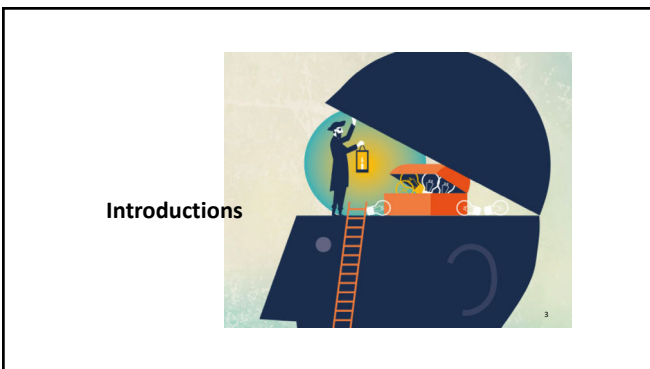




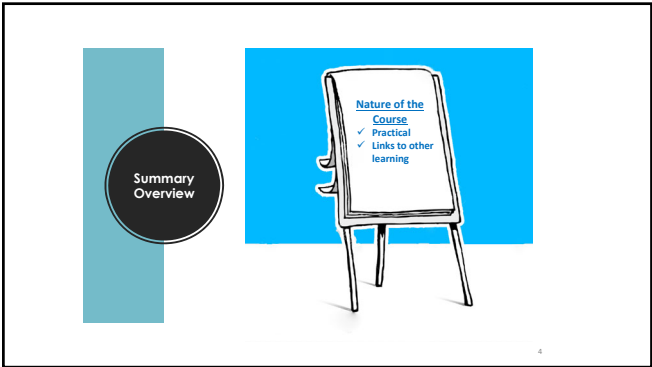
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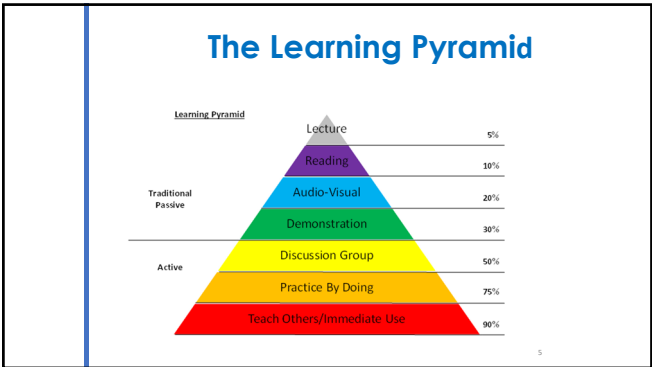
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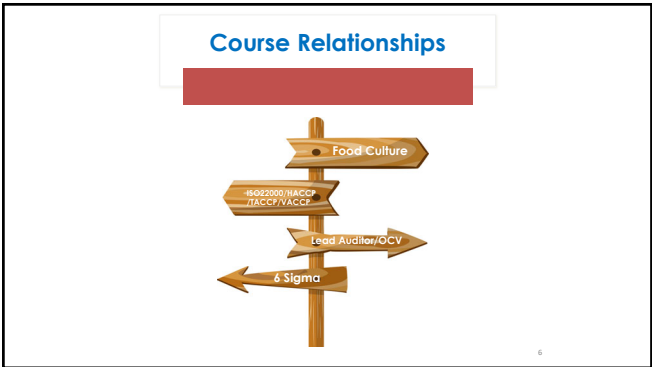
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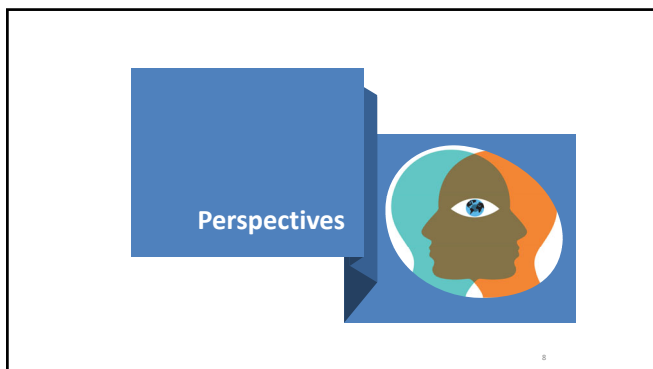
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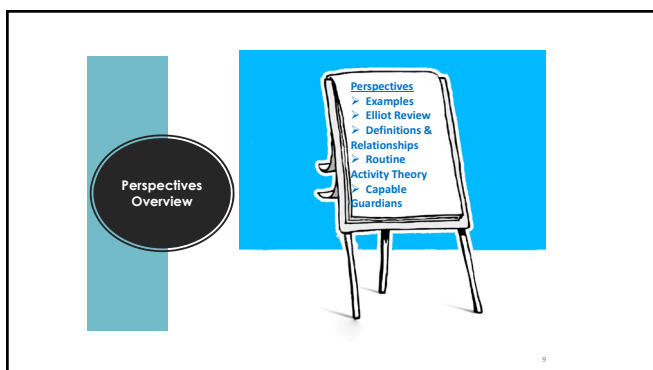
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[illegible]

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[illegible]

**Dying for a Sweet? –The
'Bradford & Punjabi' Sweet
Incidents**



THE GREAT LUGGAGE-BAGGERS.
A Piece of Antiquity.



11

Nature, Substance & Quality

- **S14 FSA** - Offerance to sell to the purchaser's preproject food not of:
 - **Nature** ("Difference") *Riley Bros (Hajdu)* Ltd vs (Helmendon) (1932) 44 TLR 218
Butter tuffes containing coconut fat.
Held - Butter tuffes implied only butterfat.
 - **Substance** - ("Compatible with the demand") *Held v Chemists & Druggists (1907) 41 LL ER 209 - Penicillin in milk.*
 - **Quality** - ("Commercial Quality" - including description") *Goldwyn John Morrison Ltd (1981) 3 All ER 257 - 52 FdA 195C - (s. 14(2) FSA) the fat in mince mixed beef.*
 - 1) purchaser's "demand" depends on express contractual terms or on what is inferred from all surrounding circumstances.
 - 2) quality demanded is that of the purchaser not of the analyst.
 - 3) quality demanded, where displayed on a notice, is the quality so declared, if de minimis deficiency in quality is not to the purchaser's prejudice.
- **Disjunctive**
- **Well established/longstanding provisions of Food Law.**



12

Falsely Advertising/Describing/ Presenting Food etc.

- S15 FSA S14 FSA - Offence to :
- Falsely Describe – e.g. Port not Portuguese provenance. *Sandeman v Gold (1924)* 1 KB 107
 - Includes omissions – R vs Kyslant (1932) 1 KB 442, Re Share prospectuses – An analogous law provision.
- Likely to Mislead- *Arlidge vs Blue Cap Foods (Kent) Ltd (1965)* 63 UGR 167 – Re Fully prepared sliced selected tins of apples 25% solids lost & added water.
- Derived - Well established longstanding provisions of Food Law.

13

Pub. J. Biosci. Sci. Biol. 2016; 48(2): 28-31

SUDAN DYES AND THEIR POTENTIAL HEALTH EFFECTS

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PCMR Laboratories Complex, Ferozpur Road Lahore-54000, Pakistan

³Institute of Biochemistry and Biotechnology, University of the Punjab, Lahore.

Abstract: Sudan dyes are synthetic, oil-soluble, and coloured azo dyes, which are not permitted by the authorities to be used in food. They are, and the United States for the purpose of food coloring. Sudan dyes I, II, III, IV, and their degradation products are considered hazardous to human health due to their mutagenicity, genotoxicity, and carcinogenicity which leads to cancer. Many experimental studies on animal species have confirmed the induction of tumours due to the presence of different Sudan dyes in food products. Sudan dyes are described to have numerous characteristics, they easily get dissolved through animal cells and directly cause health problems. This paper discusses the harmful effects of Sudan dye.

Keywords: Sudan dye, hazard, health effects

Received: January 11, 2016; Accepted: February 11, 2016

***Author for Correspondence:** shamim4@pu.edu.pk

RECALLED

Sudan Dye Incidents

14

Melamine in Milk

15

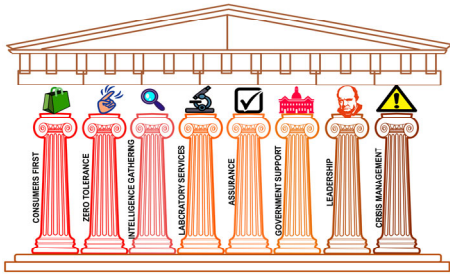


Operation Tacannna & Scallop Fraud

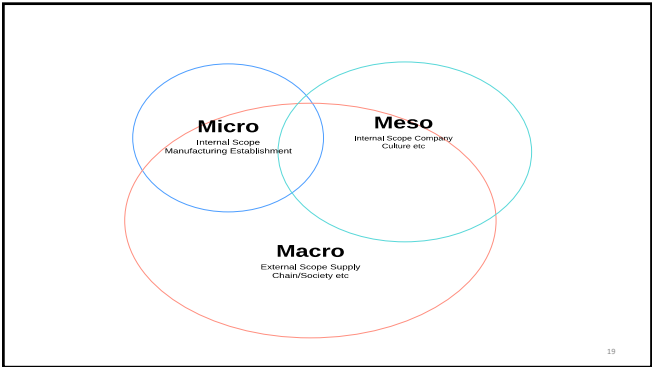
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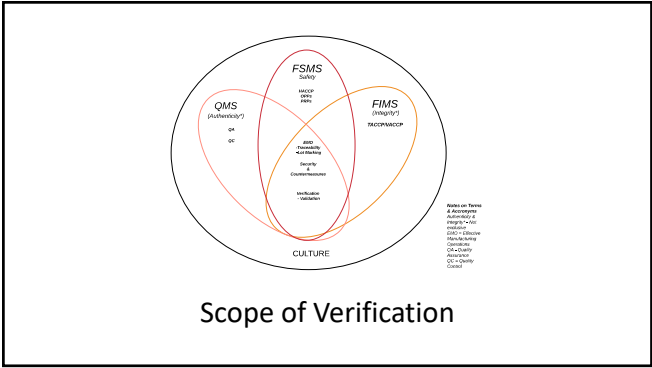


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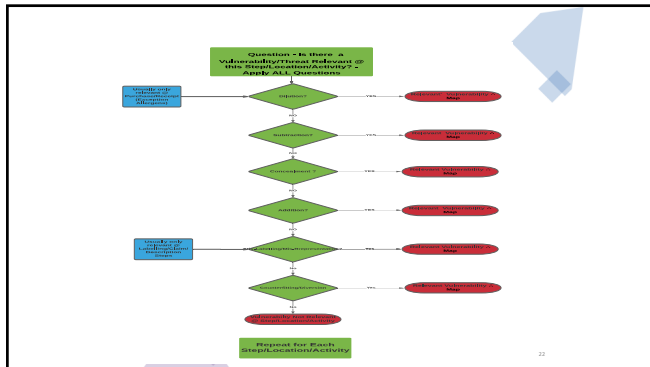
Typology of Food Fraud

UNCL Type of Food Fraud	Prevalence (under-reporting)	Severity (over-reporting)	Control (Type of Food Fraud)
Substitution	The process of replacing a food or part of a food with another food or part of a food, which is not the same as the original food or part of the product.	Substitution of a food or part of a food with another food or part of a food, which is not the same as the original food or part of the product.	Substitution of a food or part of a food with another food or part of a food, which is not the same as the original food or part of the product.
Contamination	The process of adding a substance to a food, which is not intended to be there, and which may be harmful to health.	Contamination of a food with a substance, which is not intended to be there, and which may be harmful to health.	Contamination of a food with a substance, which is not intended to be there, and which may be harmful to health.
Adulteration	The process of adding a substance to a food, which is not intended to be there, and which may be harmful to health.	Adulteration of a food with a substance, which is not intended to be there, and which may be harmful to health.	Adulteration of a food with a substance, which is not intended to be there, and which may be harmful to health.
Intentional adulteration	The process of adding a substance to a food, which is not intended to be there, and which may be harmful to health.	Intentional adulteration of a food with a substance, which is not intended to be there, and which may be harmful to health.	Intentional adulteration of a food with a substance, which is not intended to be there, and which may be harmful to health.
Unintentional adulteration	The process of adding a substance to a food, which is not intended to be there, and which may be harmful to health.	Unintentional adulteration of a food with a substance, which is not intended to be there, and which may be harmful to health.	Unintentional adulteration of a food with a substance, which is not intended to be there, and which may be harmful to health.
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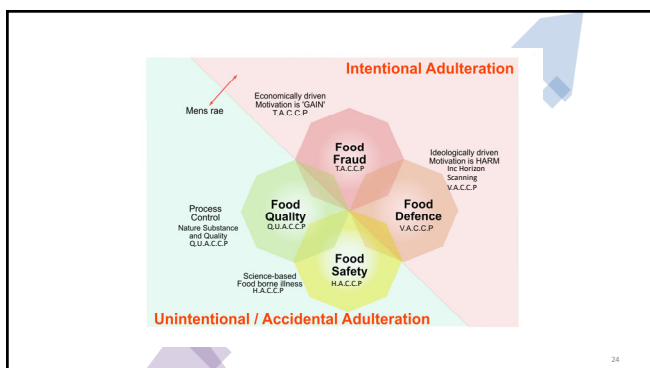
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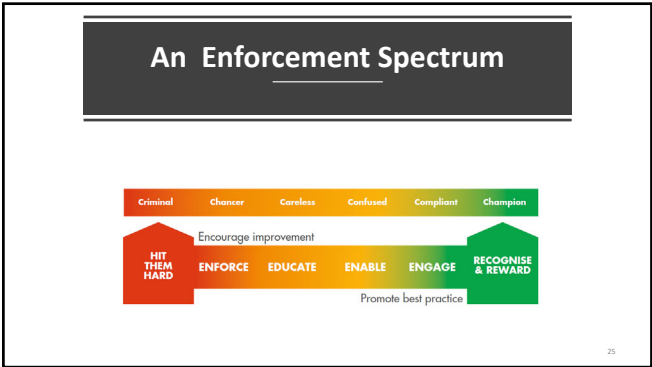
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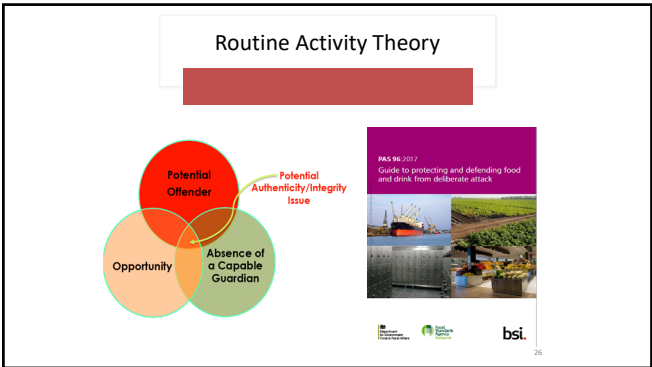
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Complexity & Simplification



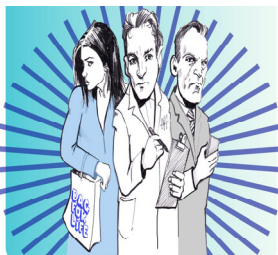
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Literature Review

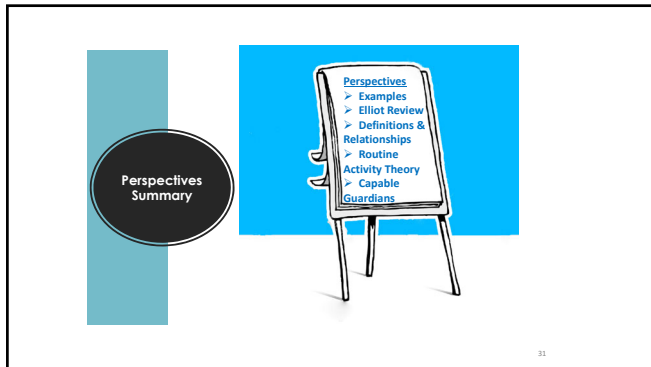


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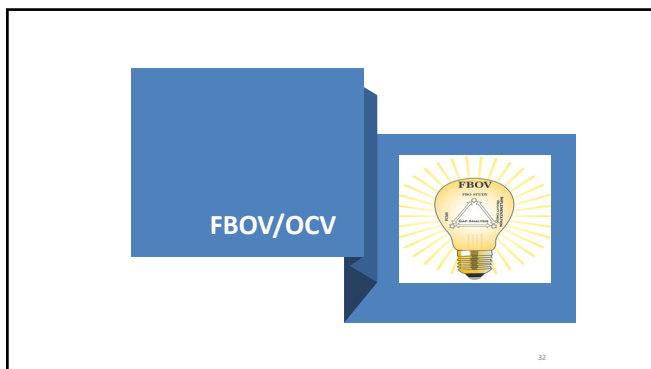
Capable Guardians



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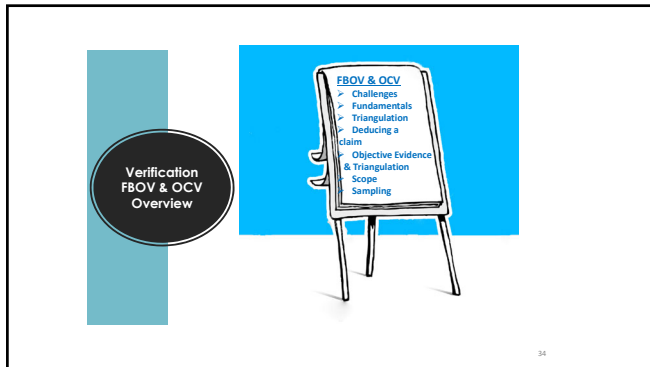
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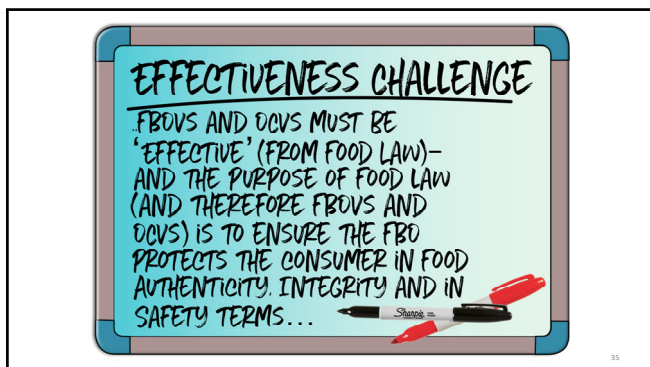
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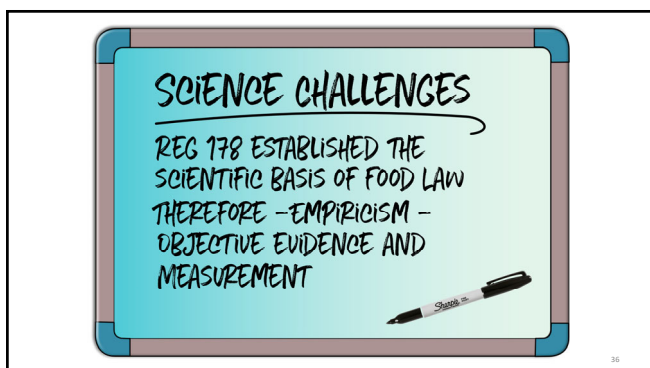
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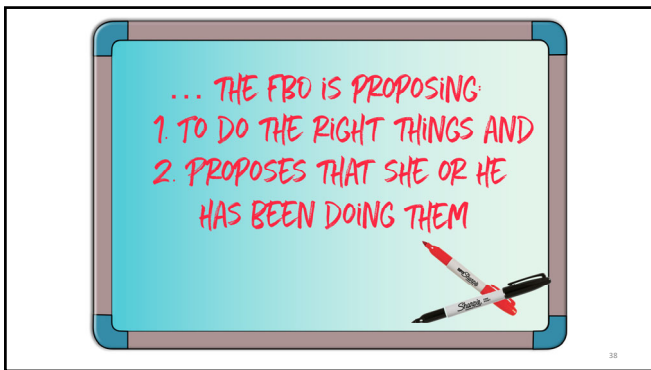
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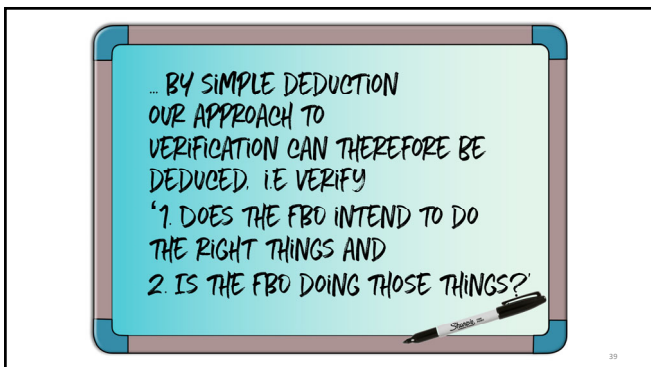
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STRUCTURING A VERIFIER'S SOLUTION

FROM FBO PROPOSITIONS AS A PRIORITY WE CAN DEDUCE 3 CARDINAL POINTS OF REFERENCE...

VERIFIER PROPOSITION

FBO PROPOSITION

FBO IMPLEMENTATION (REALITY CHECK)

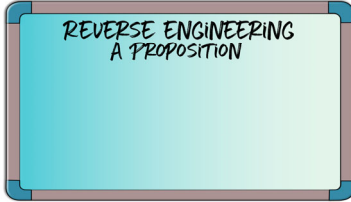
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REVERSE ENGINEERING A PROPOSITION

42

Exercise – Reverse Engineering the FBO’s Proposition



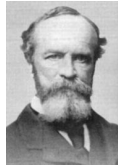
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43

Objective Evidence

“Objective evidence and certitude are doubtless very fine ideals to play with, but where on this moonlit and dream-visited planet are they found?”

- William James 1842–1910 (considered to be one of the greatest philosophers of the pragmatic school)



“Information that can be proved true, based upon facts obtained through observation, measurement test or other means”

- First defined BS EN 8402/1995

- Referred Regulation (EC) 178/2004 - but not defined

44

44

Attributes of Objective Evidence

- ✓Scientific — Can the data be evaluated by independent observers to reach the same conclusions?
- ✓Scientific — Are the data documented in a manner to allow re-creation of the data or the events described?
- ✓Scientific — Does the documented evidence provide sufficient data to prove what happened, when, by whom, how, and why?
- ✓Legal — Was the documentation completed concurrent with the tasks?
- ✓Legal — Is the documentation attributable?

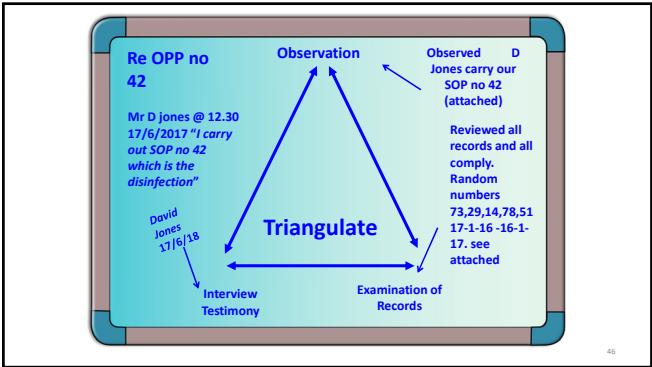


Denise Dion
USA FDA Office of
Regulatory Affairs
Primary Editor of the
FDA Investigations
Operations manual

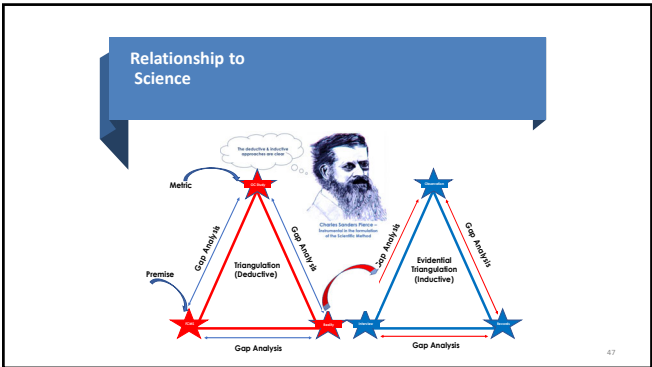


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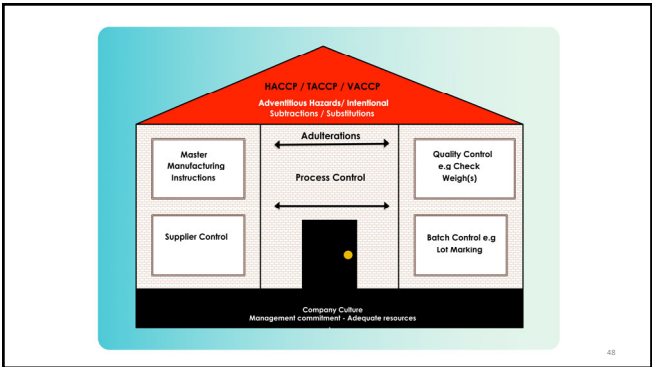
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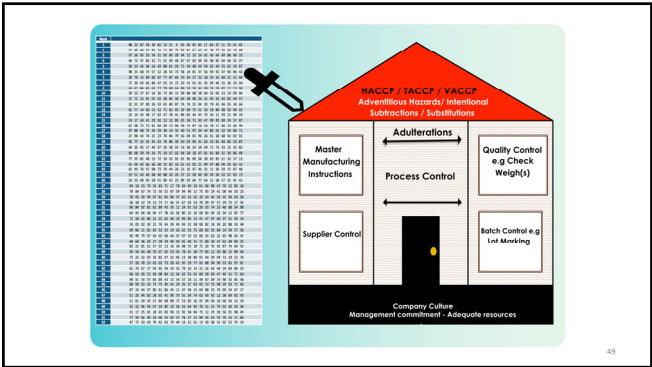
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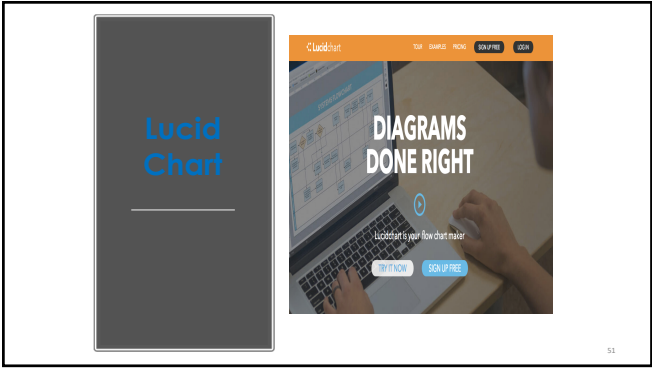
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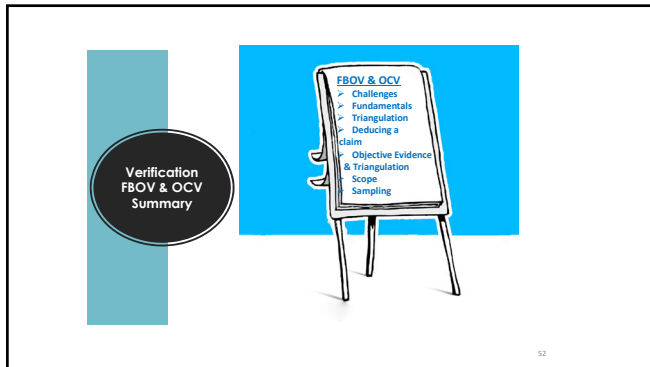
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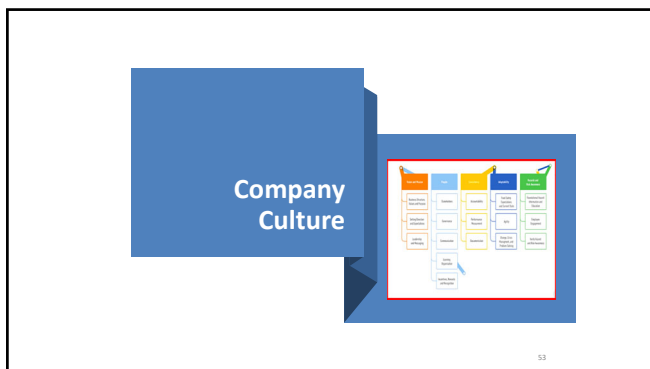


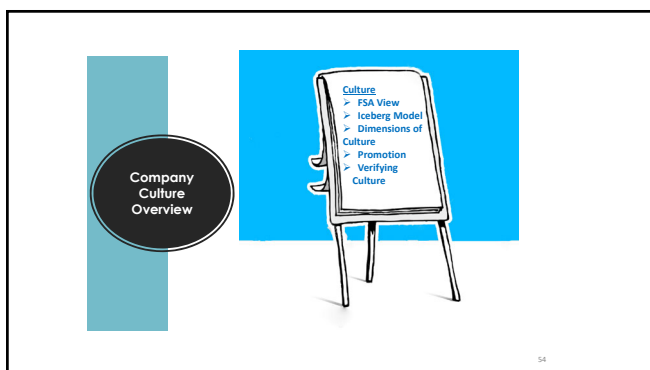
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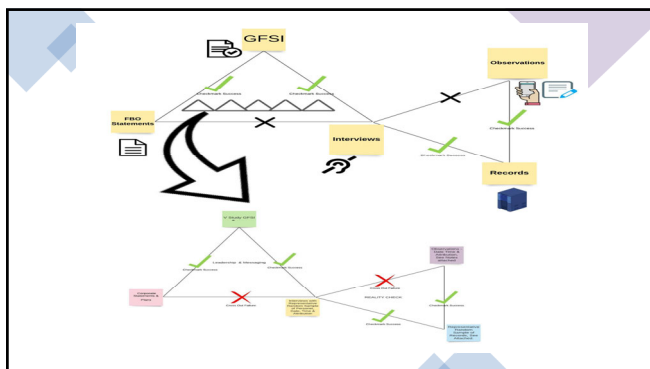




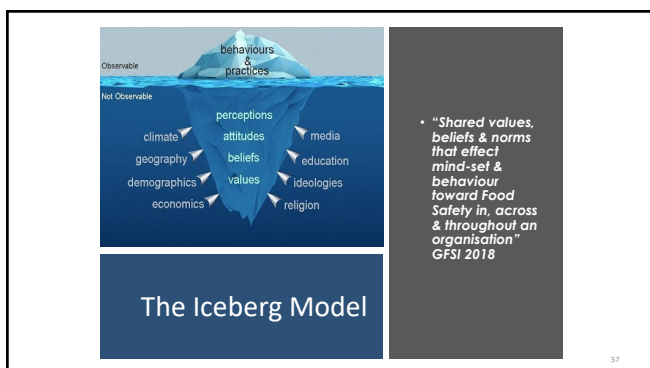




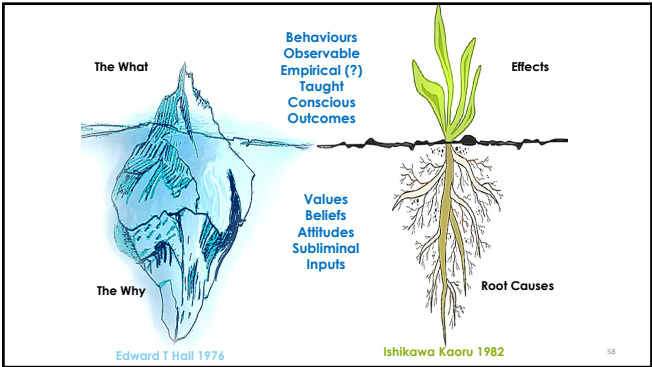
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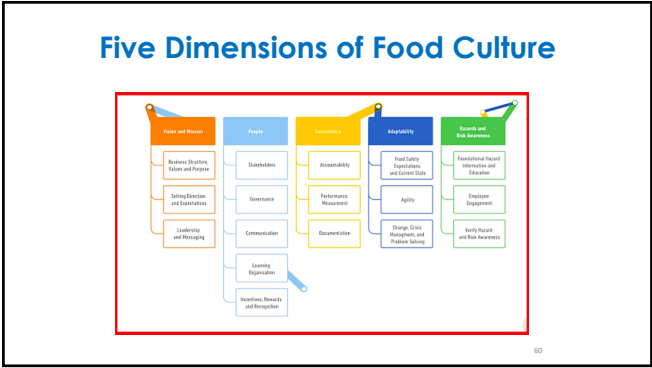
FBO Culture

"Creating a culture in which all staff are both able and confident to report suspicions of wrongdoing is vital. Businesses can do this by ensuring they provide an environment in which staff are able to see the moral as well as the commercial benefits of identifying wrongdoing, whether within or outside of their business. Working with the National Food Crime Unit, whether by sharing fraud concerns or by finding new ways to design out fraud, will make the UK food sector both a safer and a more economically prosperous place, benefiting both businesses and consumers alike"

- Andy Morling Head of FSA Food Crime Unit 2016



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Verifying
FBO
Culture

Food
Standards
Agency

Food safety culture
diagnostic toolkit for
inspectors

Food Standards Agency (2012)

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Verifying
FBO
Culture

BRC Culture Excellence
Food Safety Culture Module
Site Implementation
Manual

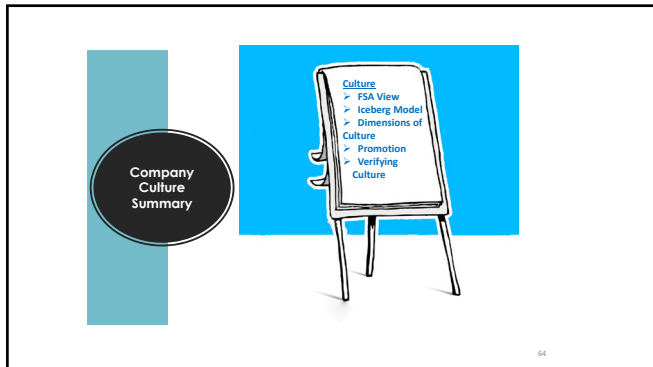
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Discussion - Promoting &
Verifying FBO Food Culture

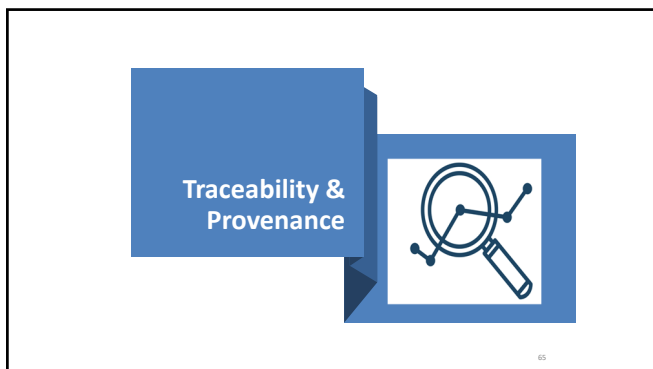


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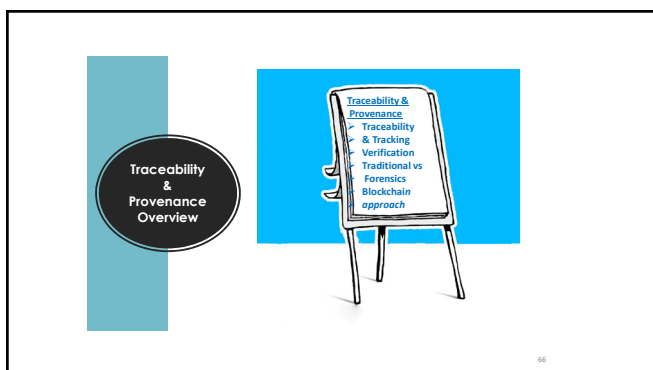
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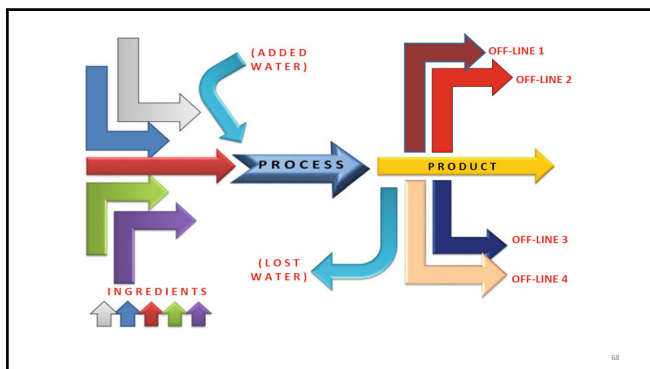
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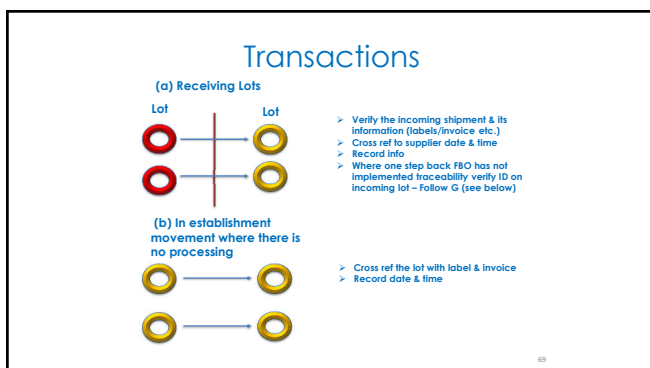
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Transactions



- Verify data re pre-combined lots, refer SOP & record
- Assign new ID to combined lot
- Link data before & after combination & record
- Record info re combination work needed for ID if any (eg date, quantity before & after combination)
- Prepare label & invoice with the new ID & attach.
- Verify pre-divided lot data & record
- Assign new lot ID to divided lots
- Record the ID linkages
- Record division data, e.g. quantities before & after division, date & time.
- Prepare label & invoice with the new ID & attach

(d) Division of a lot



- Verify pre-divided lot data & record
- Assign new lot ID to divided lots
- Record the ID linkages
- Record division data, e.g. quantities before & after division, date & time.
- Prepare label & invoice with the new ID & attach

70

[illegible]

Transactions

- (e) Processing Not Involving Combination of Lots e.g. Heating, freezing drying etc.

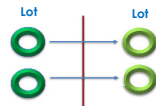


- Verify pre-processing lots data & record
- Record info re processing work required for ID - If any e.g. date & time of processing, quantities before & after processing.
- Prepare label & invoice with ID of processed lot and attach.



- Prepare label & invoice with ID of processed lot and attach.

(f) Shipment of a Lot

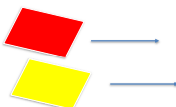


- Verify lot to be shipped & its data. Record
- Cross ref & link ID of shipped lot to buyer date & time. Record.

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Transactions

- (g) Formation of a lot (e.g. obtaining from the farm (livestock & marine products) or when receiving no Id products not covered by the FCMS



- Decide on the product lot & assign ID
- For each lot record data required for ID e.g. (producer, farm date & time).

(h) Disposal of a lot




- Verify the product lot & its data prior to disposition. Record
- For each lot record the disposal date, time & place.

72

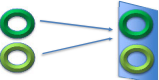
Transactions

(i) Requirements for In-House IDs




- FBO to set a rule re in-house ID, linked to incoming & out-going lot IDs.

(j) Grouping (Forming) Lots



- Assign a new ID to grouped lot
- Link to product ID before the grouping to after. Record.
- Record info re grouping work if any e.g. date, time place.

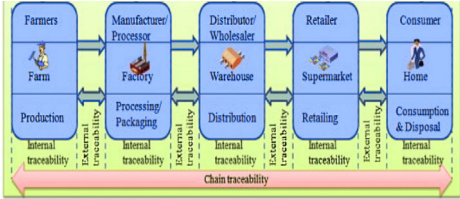
(k) Dividing Lots (e.g. a traceable unit)



- Link to product ID before the division to after. Record.
- Record info re division work if any e.g. date, time place

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Traceability



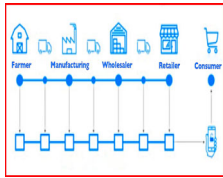
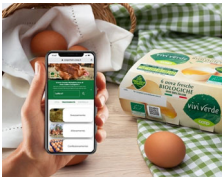
74

Traditional vs Forensics

	Traditional	Forensics
Speed	✗ Can be slow relies on checking data & each point in the supply chain	✓ Fast 1 to 5 days
Accuracy	✗ Reliant on packaging - Falls when packaging lost or counterfeit	✓ Traces product not packaging ✓ Science & algorithmic methods Can't be counterfeited without detection
Farm to Fork	✗ Reliant on packaging - Does not reach critical point of consumption	✓ Actual product assayed Trace from consumer to farm
Scientific	✗ Paper based - Prone to error	✓ Peer reviewed scientific literature ✓ Accepted as evidence in court


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Blockchain



76

Blockchain

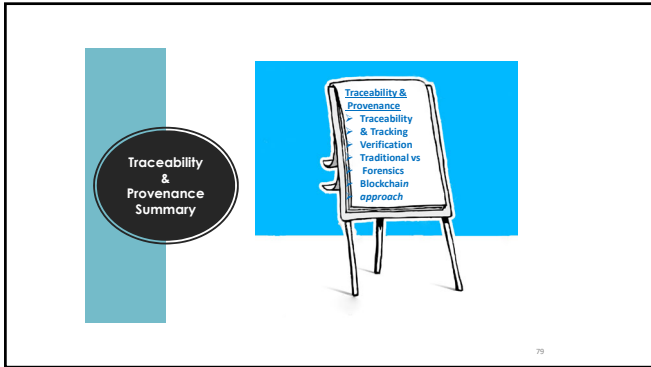


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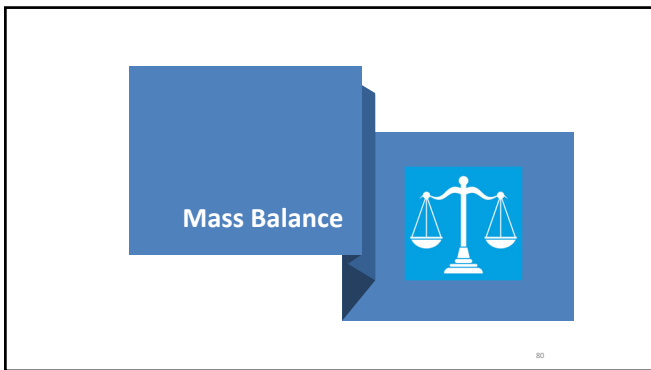
Discussion - Traceability



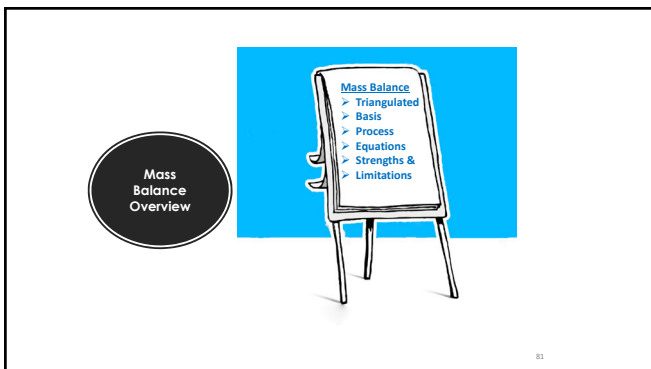
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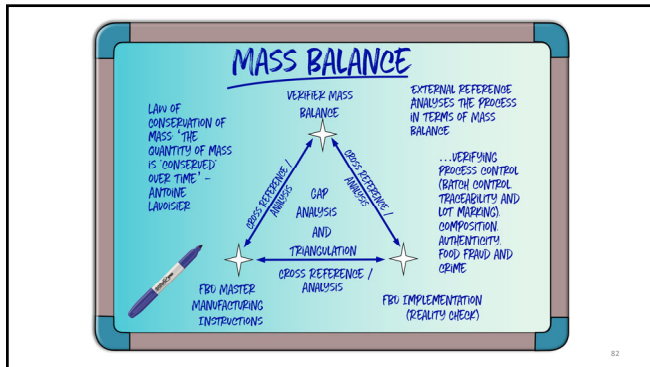
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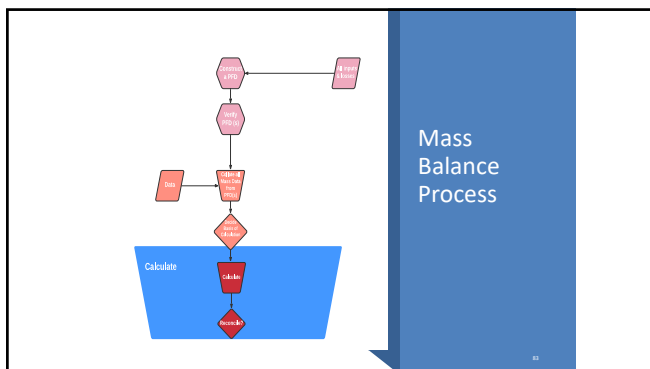
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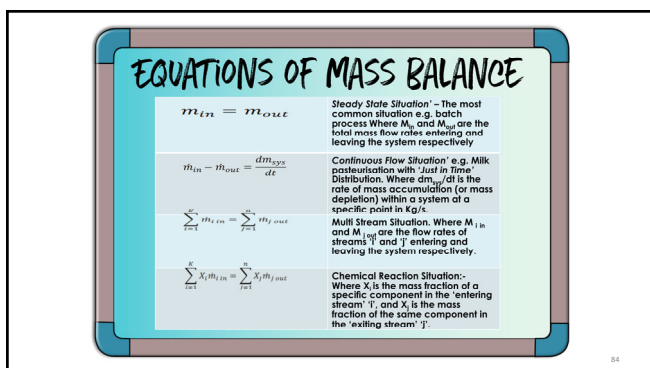
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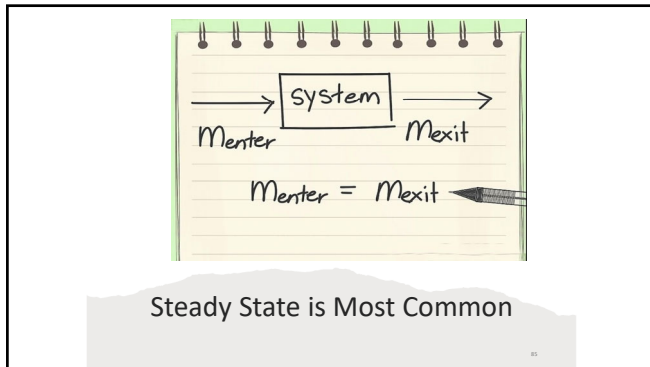
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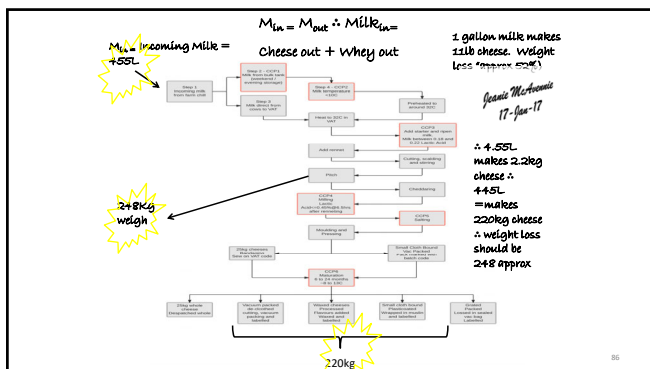
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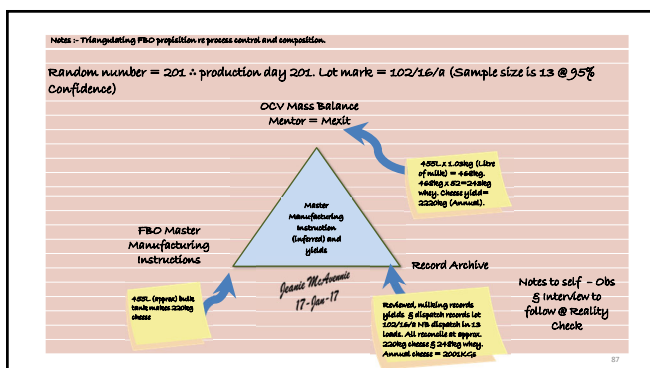
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Strengths	Limitations / Points to Consider
<ul style="list-style-type: none"> If input/output data exists, this method can be relatively cost-effective; otherwise it can be costly Can obtain estimates of FLW where no direct data exists (e.g., estimate FLW from food supply and consumption) Depending on how data are collected, may help identify waste hotspots (e.g., food categories) 	<ul style="list-style-type: none"> Can have large inaccuracies depending on the type of data available Difficult to estimate uncertainties Requires quantification of all major flows of food (e.g., food going to feed animals) Difficult to apply if there is substantial addition or removal of water (e.g., evaporation of water during cooking) May be difficult to determine root causes

88

Exercise – A mass Balance



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Ploys & Hacks

90



Overlaps
Yields – Mass Balances, Traceability – Product
Recall

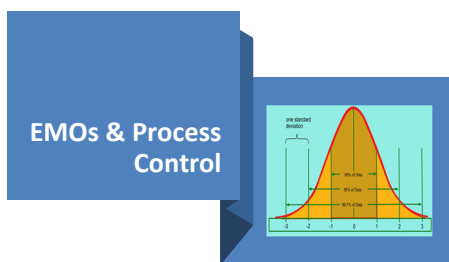
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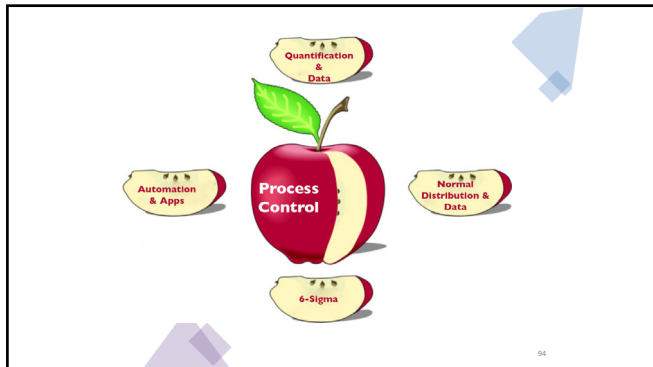
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92

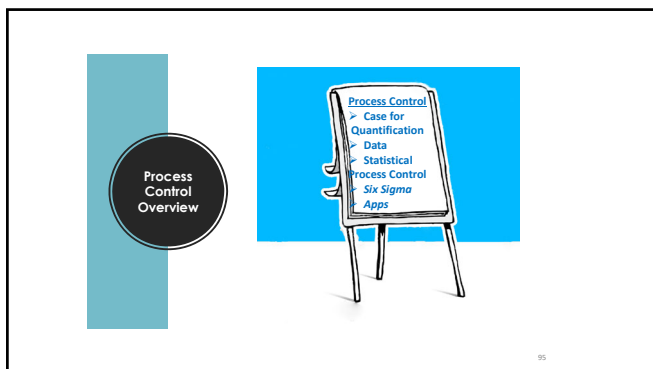


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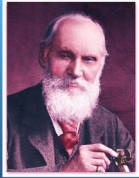


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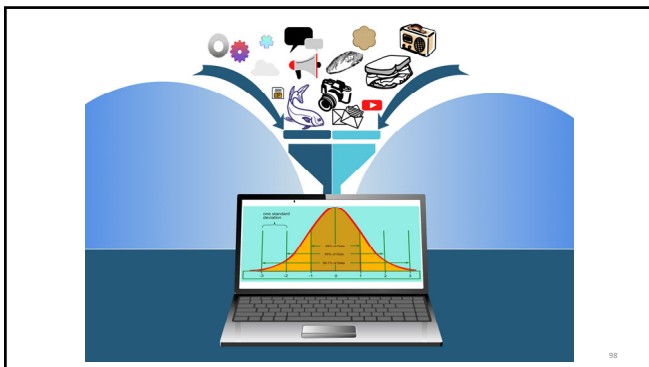
Quantification



I often say when you can measure what you are speaking about, and express it in numbers, you know something about it, but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely, in your thoughts, advanced to the stage of science, whatever the matter may be.

97

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Statistical Process Control


改善

Kai = Change

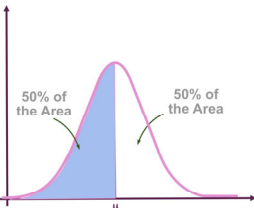
Zen = Good

William E. Deming





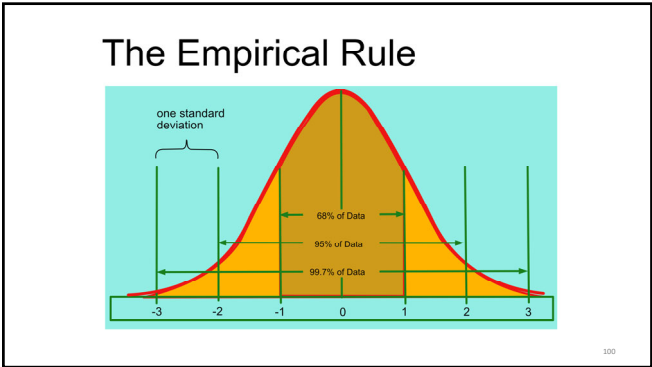
Walter A. Shewhart



A normal distribution curve is shown with a vertical line at the mean (μ). The area under the curve to the left of the mean is shaded blue and labeled "50% of the Area". The area to the right is labeled "50% of the Area".

99

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Common Cause & Special Cause Variation


Common Cause Variation

- A source of **variation** caused by unknown factors that result in a steady but random distribution of output around the mean/average of the data. **Common cause variation** is a measure of the process's potential, or how well the process can perform when **special cause variation** is removed.



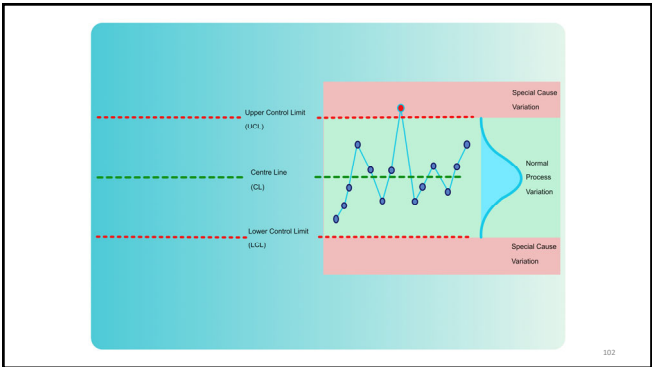
Special Cause Variation

- Special cause variability** is a shift in output caused by a specific known factors such as environmental conditions or processing errors. It is insidious but can be accounted for directly and potentially removed. It is a **measure of process control**. Also referred to as "**exceptional**" or "**assignable**" variation.

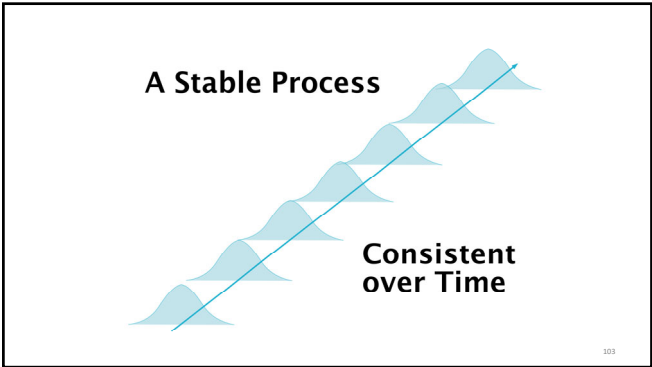


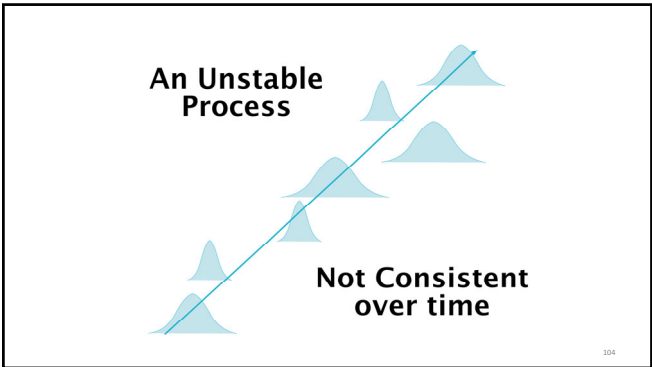
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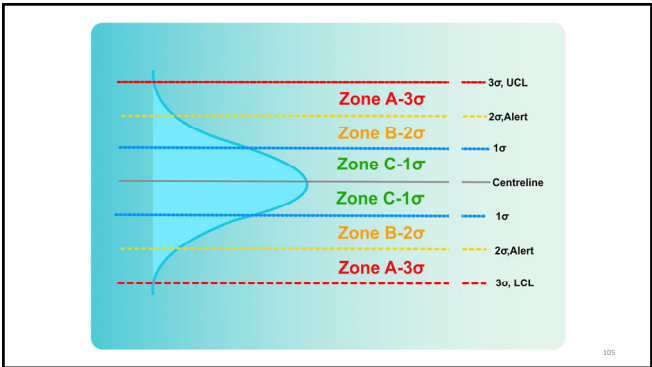
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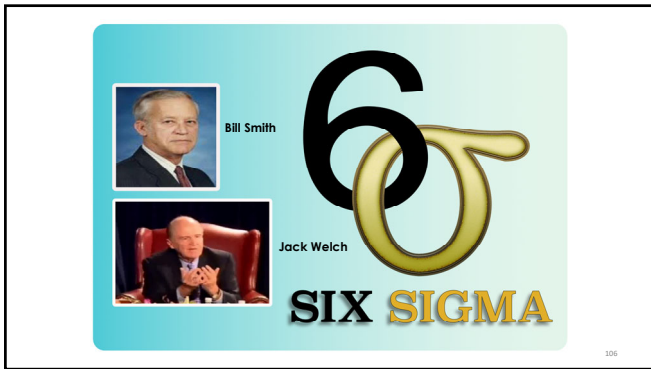


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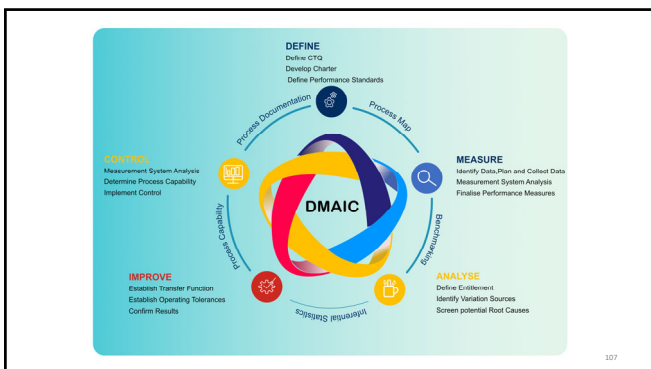




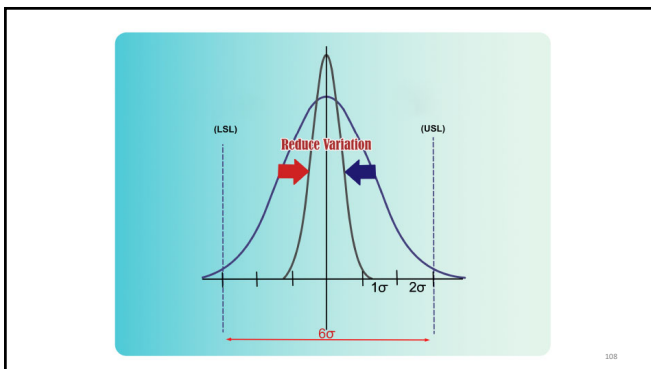




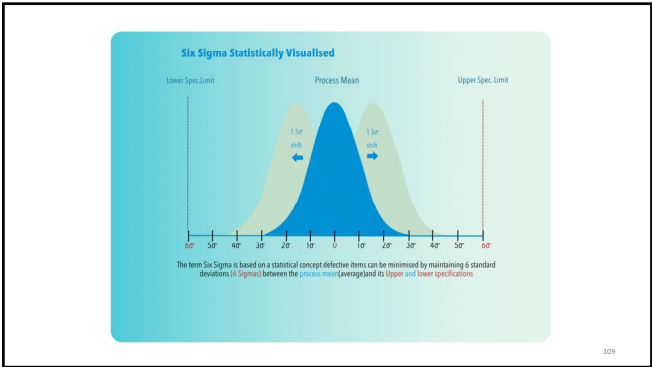
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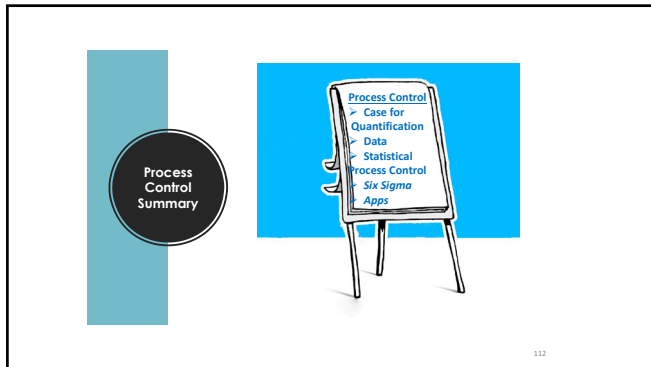
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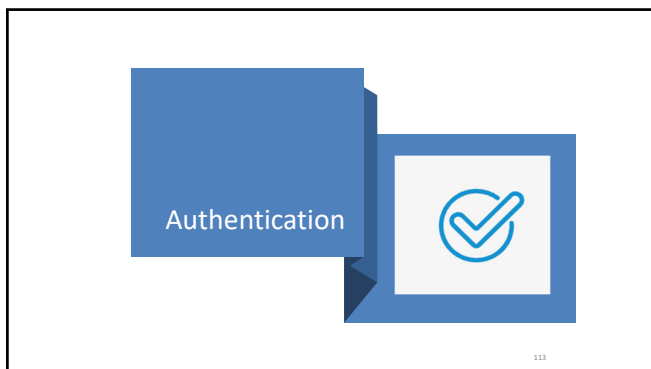
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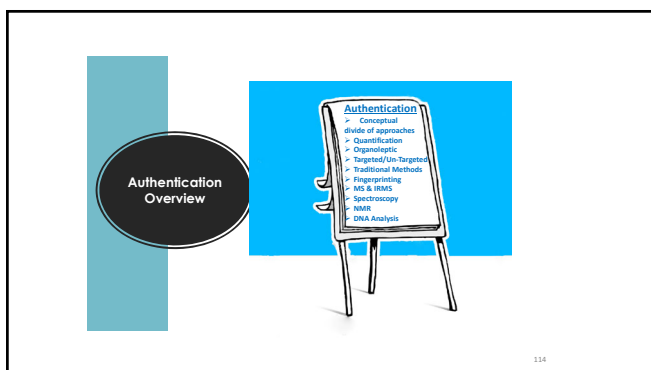
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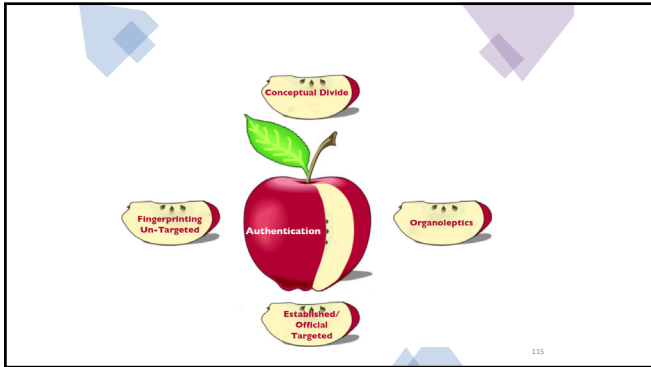
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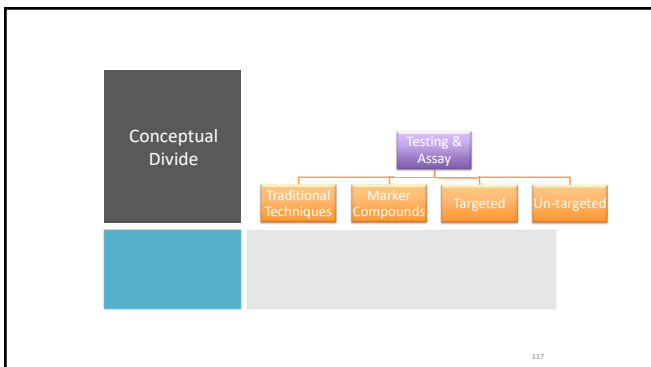
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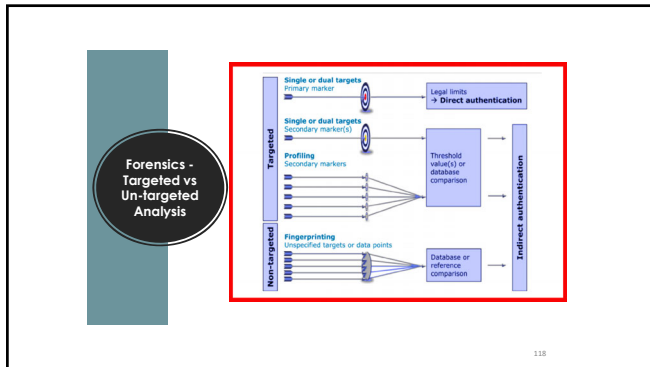
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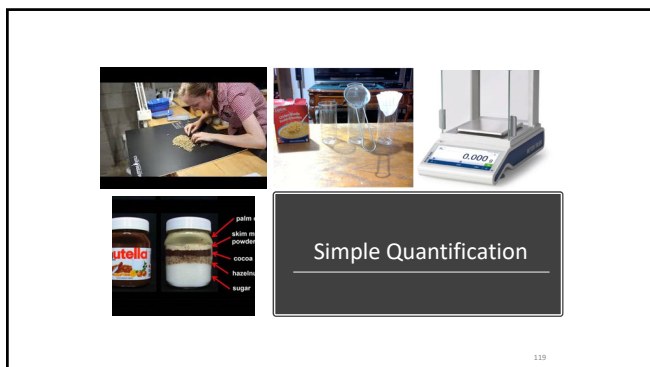
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117



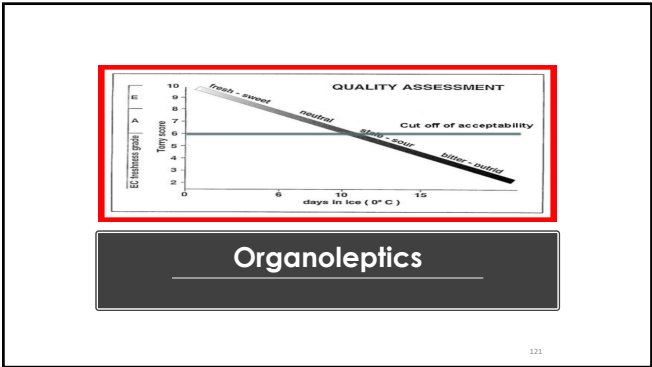
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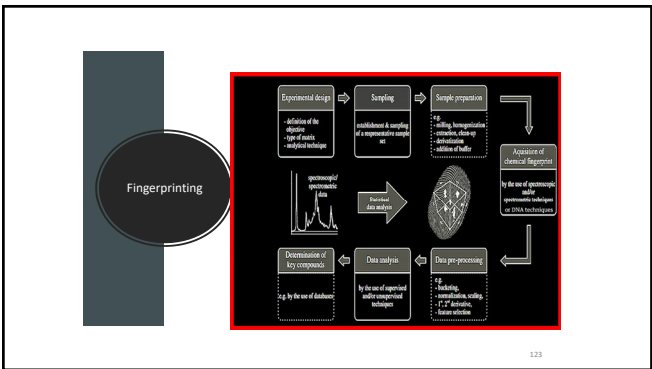
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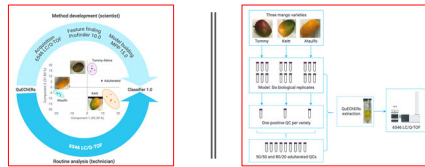
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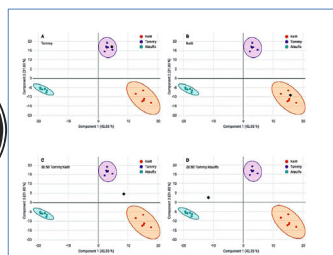
Mass Spectrometry



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MS Profile for the Mango Case Study



125

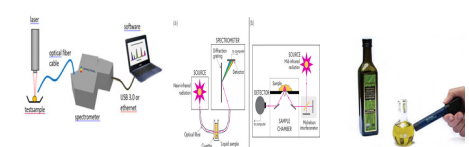
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Isotope-ratio mass spectrometry (IRMS)

126

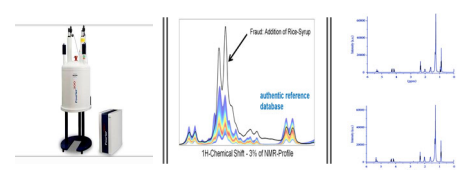
126



The diagram illustrates various spectroscopy techniques: (a) Infrared (IR) spectroscopy showing light passing through a sample and being detected by a spectrometer. (b) Raman spectroscopy showing light scattering by a sample. (c) UV-Vis spectroscopy showing light absorption by a sample. (d) NMR spectroscopy showing a sample in a magnetic field with a spectrometer. (e) A photograph of a bottle of olive oil and a small container of oil.

Spectroscopy


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The diagram illustrates NMR spectroscopy: (a) A photograph of an NMR spectrometer. (b) A graph showing the chemical shift (ppm) of a sample, with a peak labeled 'Fruit Addition of Pine Syrup' and a reference peak labeled 'authentic reference database'. (c) A graph showing the chemical shift (ppm) of a sample, with a peak labeled 'Fruit Addition of Pine Syrup' and a reference peak labeled 'authentic reference database'.

Nuclear Magnetic Resonance

128

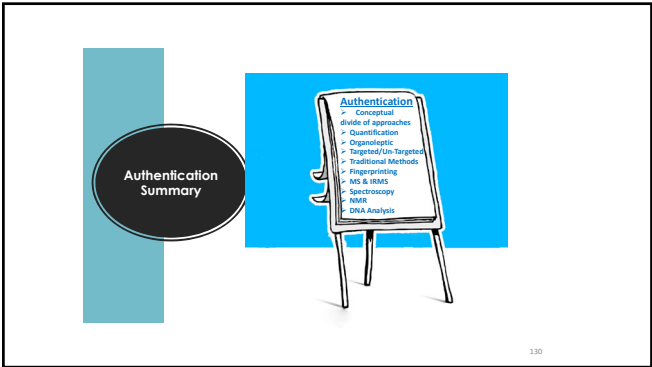


The diagram illustrates DNA analysis: (a) A photograph of a DNA double helix structure. (b) A flowchart showing the process of testing food for animal DNA: 'Testing food for animal DNA' leads to 'DNA extraction' and 'DNA amplification', which then leads to 'DNA sequencing'. (c) A photograph of a DNA sequencing kit.

DNA Analysis

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