Microbiological evaluation program

Improve Abattoir Hygiene

Presented by:

Peet Grobler

Food Safety Services Director

Agenda

- Causes of Food Safety incidences
- Foodborne illness
- Risk areas
- Microbiological control

Source: Dr Richard North & JDC (1999)

Management investigations:

Causes of Food Safety incidents often expressed in terms of biological or mechanistic causation … management failure.

1. No risk assessments on new products/processes
2. Inadequate contingency planning
3. Profits before safety
4. Lack of communication
5. Non recognition of flawed procedures
6. Lack of post incident evaluation
7. Lack of stability in operations
8. Absence of consistent procedures
9. Misuse of equipment
10. Unrealistic demands on operations

Source: Dr Richard North & JDC (1999)

Foodborne Illness - Definition

- **Foodborne illness** is a general term for illnesses caused by eating **contaminated** food or water.
  - Food Poisoning and Foodborne Disease both come under this heading.

Everybody is at risk of Foodborne illness

if Food or Water is contaminated

and then consumed

Food Contamination

- The causative agent of Foodborne Illness is the micro-organism, toxin or poison that makes you ill.
- Causative agents are
    - Microbiological contaminants
    - Chemicals contaminants
    - Metals such as Copper and Mercury

- Micro-organisms are the most common causative agents

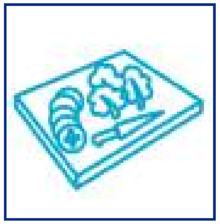
The Major Causes of Foodborne Illness

SAFEKEY™
A Fresh Approach to Food Safety

- Temperature abuse

- Poor personal hygiene

- Cross contamination



JohnsonDiversey
Clean is just the beginning

Cross Contamination

- Many contaminants are naturally present in Raw food

  = **Intrinsic Contamination**

- Environment contains many possible contaminants
  - People, Pests, Food Waste, Equipment, Cleaning utensils

  = Extrinsic Contamination

Rapport 17 Aug 2008

4 NUUS

RAPPORT, 17 AUGUSTUS 2008

Verlam, blind oor 'n paar druppels in kos

Sources of Pathogenic Bacteria

Commonly Found In...

	Sores, cuts, skin, nose	Human / Animal Waste	Insects	Rodents	Soil	Water
Staph. aureus	✓					
Shigella		✓	✓	✓		
Salmonella		✓			✓	✓
Clostridium perfringens		✓				
E. Coli		✓			✓	✓
Bacillus cereus	✓				✓	✓
Clostridium botulinum		✓			✓	
Listeria		✓			✓	

Factors Affecting Bacterial Growth

F	**Food**
A	**Acidity (pH)**
T	**Temperature**
T	**Time**
O	**Oxygen**
M	**Moisture**

pH of Foods

Acidic | Basic *(Alkaline)*

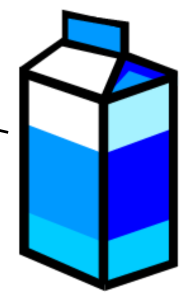
1 | 4.6 | 7 | 14

Very Acidic | **Very Basic**

Vinegar = 2.0

Baking Soda = 8.1

Raw meat
pH 5.5-6.4



Milk
pH 6.6

Most Micro-organisms don't grow at pH less than 4.3 or above pH 7.0

The Natural pH of Food = 4.6 - 7.0 - therefore micro-organisms like to grow in and on the surface of these foods

Temperature

Temperature

- 32-43^{o}C - Ideal
- 21^{o}C
- 10^{o}C
- 5^{o}C
- 0^{o}C

Time for Bacteria to Double

- 20 Minutes
- 40 Minutes
- 180 Minutes
- 6.7 Hours
- 20 Hours

Most Bacterial growth is faster at temperatures of between 32°C and 43°C.

- This is known as Ideal Growth Temperature
- Temperature of the Human Body = 37°C

Risk Areas

- Personnel practices
- Good Manufacturing Practices
- Construction and maintenance
- Waste control
- Pest Management
- Cleaning and Sanitation
- Hygienic design

Foodborne illness Carriers

- Carriers are people who show no symptoms of illness but excrete food poisoning or foodborne disease organisms
  - Convalescent carriers have recovered from an illness but still harbour the organism
    - Convalescent state can be prolonged e.g. several months
    - Organisms may be excreted intermittently
  - Healthy carriers are people who display no symptoms but harbour the organism

Effect on surface sanitation

- Gross soil removal
- Pre rinse
- Apply detergent
- Post rinse

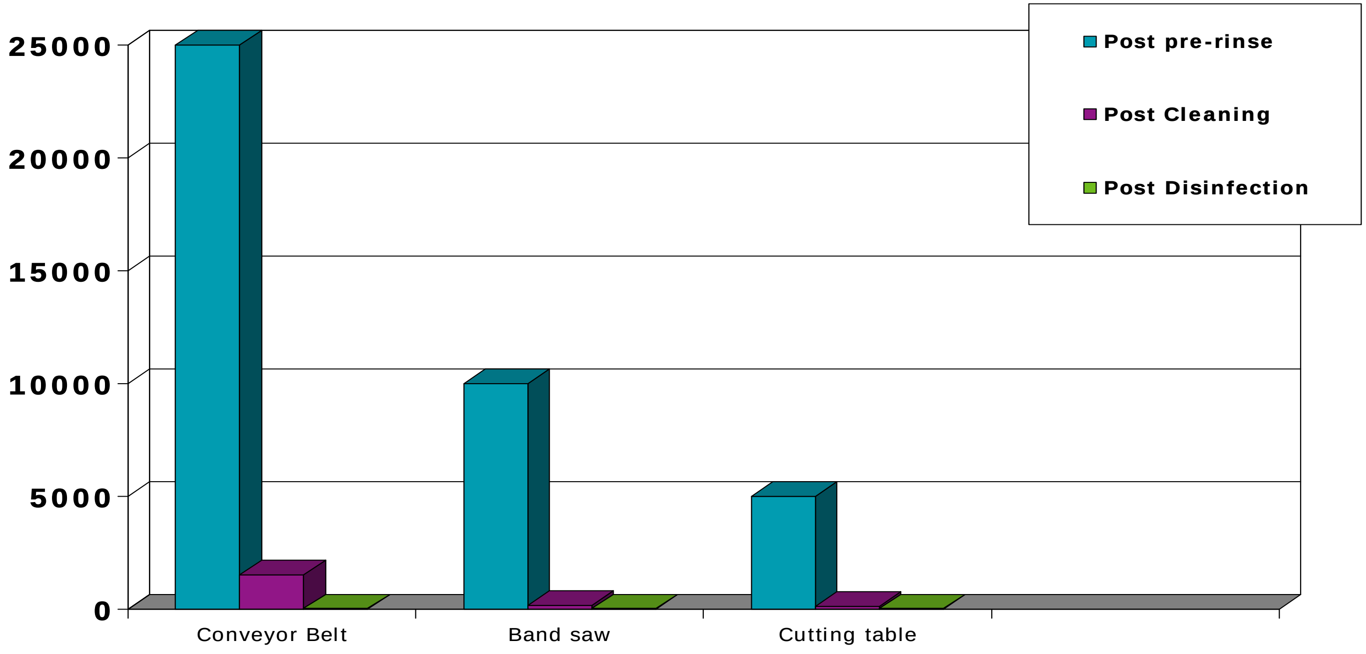
95% of hygiene level achieved in this stage

- Apply disinfectant

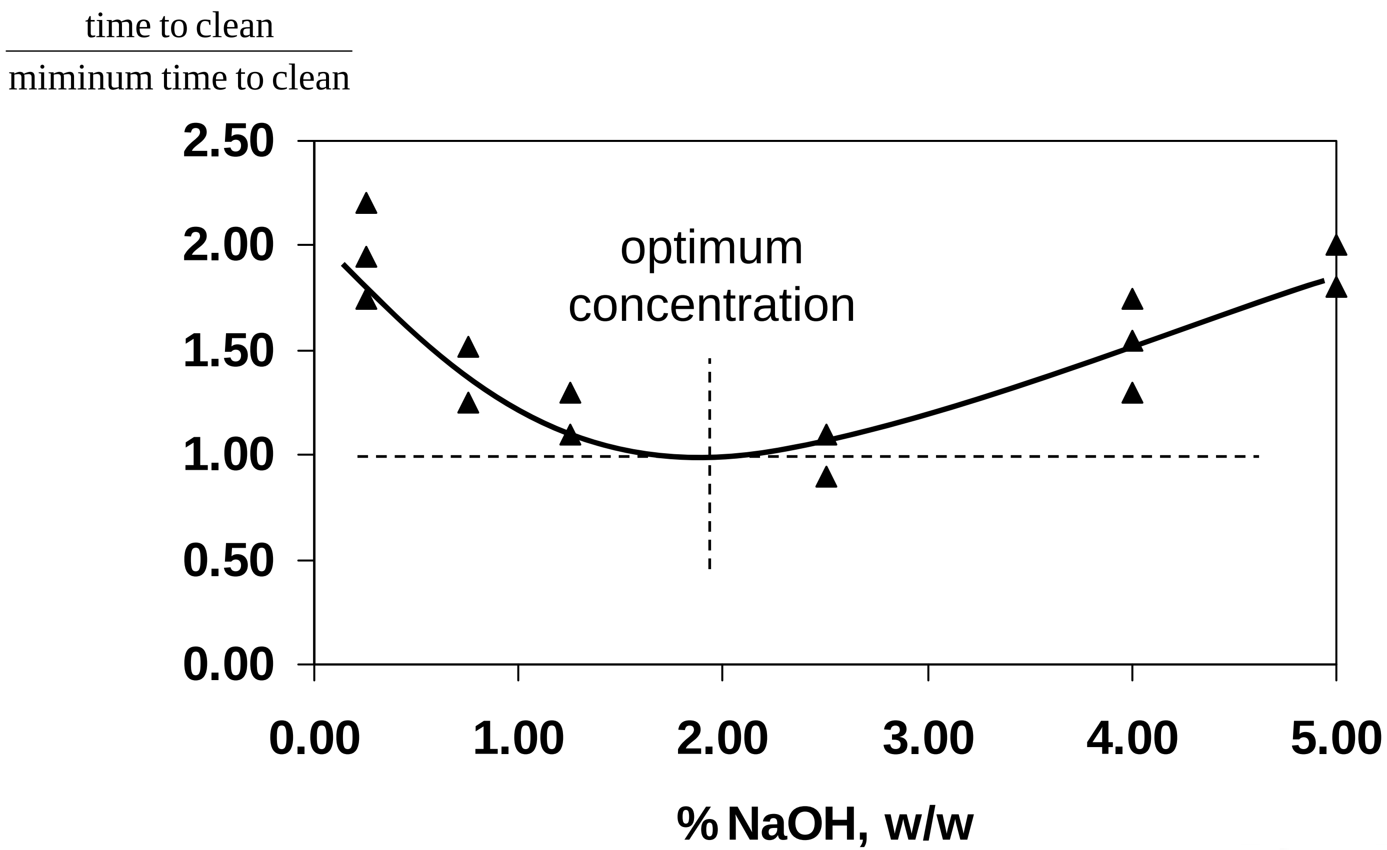
5% here to secure cleaning programme

If having microbiological issues concentrate at points 1 to 4 to resolve

Practical evaluation – cfu/10 cm2



Chemical concentration vs cleaning time



JohnsonDiversey
Clean is just the beginning

Hygienic design

SAFEKEY™
A Fresh Approach to Food Safety

- Materials of construction:

  Product /Cleaning products compatibility

- Surface finish:

  A rough surface is difficult to clean

- Accessibility:

  Ease of equipment inspection is necessary to confirm cleaning results

- Free draining:

  Water promote microbiological growth.

JohnsonDiversey
Clean is just the beginning

Microbiological Control

Successful microbiological control depends on several conditions:

- Creation and consistent following of a sampling plan
- Correct sampling techniques
- Careful documentation and valuation of results

Sampling Plan

• Equipment Swabs	TPC	SABS 049
• Hand swabs	E. coli/S . aureus	
• Air plates	Mould	
• Water	TPC/E.coli	SABS 241
• Product		

TPC/E.coli/Salmonella/Staph/Clostridium and Listeria

JohnsonDiversey
Clean is just the beginning

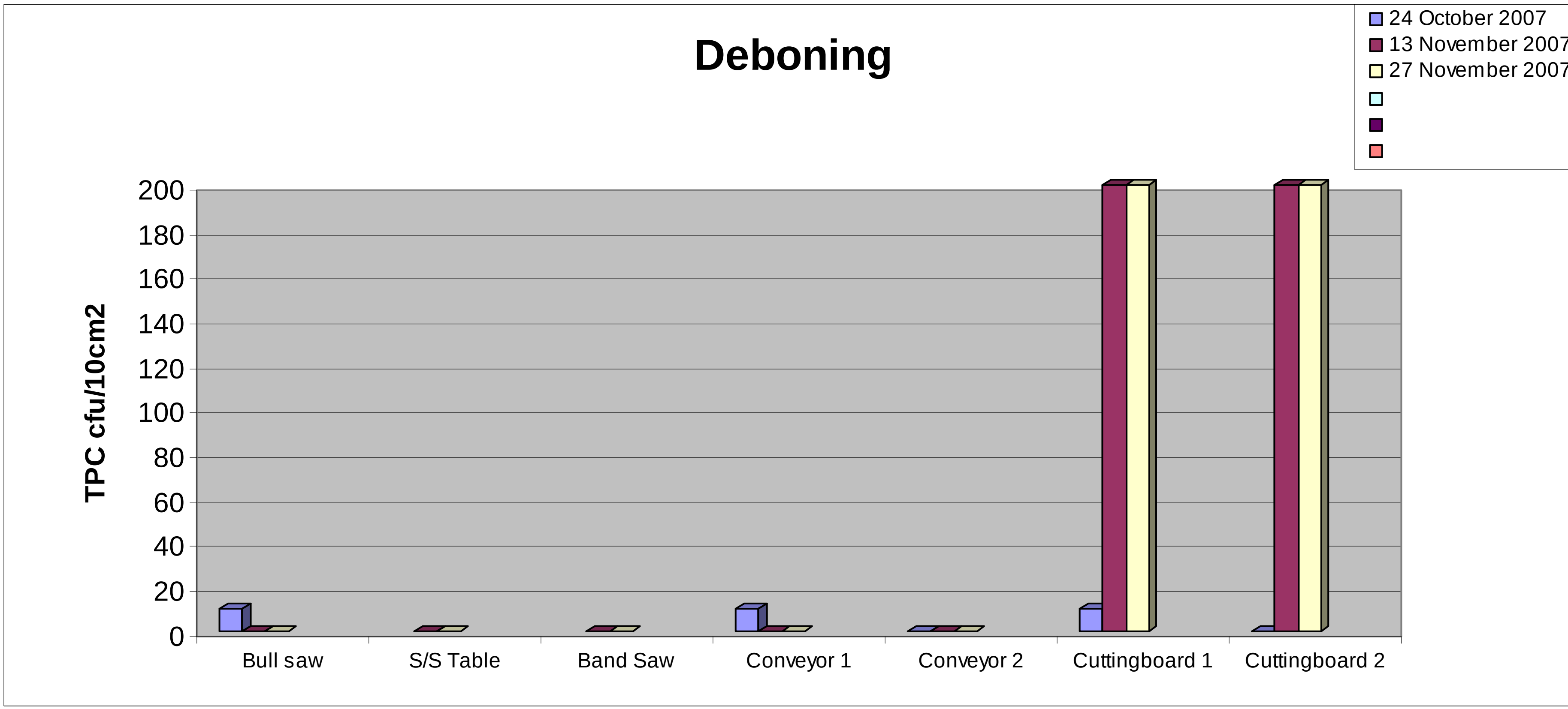
Sampling Technique - surfaces

- Dip the swab in sterile in-activator solution

- Vigorously rub the bud of the swab over the area to be sampled (normally 10cm2).
- Rotate the swab as to bring the whole area into intimate contact with the surface.
- Replace the swab in its container and reseal it.

Alternatives – Rodac plates/ATP monitoring

Valuation of results - surfaces



Valuation of results - surfaces