



Cold Chain 101:

Waste not...want not!...or

Follow the ice cream....



**Before you eat...your mother
told you to....?**



Clean or Dirty?



Why provide shade,
cool, chill, freeze your
produce?





What is inside that big white building?

Temperature abuse



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Lostarts | Dreamstime.com

<https://foodsafetyinfosheets.org/category/temperature-abuse>



Food Safety Info Sheets

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SEARCH

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RECENT SHEETS

- Six cases of campylobacteriosis linked to chicken liver
- 103 cases of salmonellosis linked to North Carolina church fundraiser meal
- Fresh produce linked to cyclosporiasis outbreak
- New food safety infosheet: Outbreak traced to beef stew held at room temperature
- New food safety infosheet: Norovirus is a problem for restaurants

RISKY PRACTICES

- Cross-contamination
- Food Handling
- Hand Washing
- Improper Storage
- Inadequate Sanitation
- Poor Hygiene
- Spoilage
- Temperature Abuse

PATHOGENS

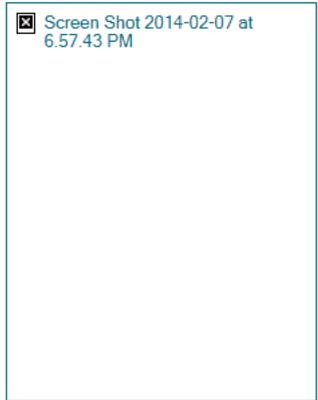
- Botulism
- Campylobacter
- Clostridium
- E. coli
- H1N1
- Hepatitis A
- Listeria
- Norovirus
- Salmonella
- Scrombrotoxin
- Shigella
- Staphylococcus

Category Archive

You are currently browsing the category archive for the 'Temperature Abuse' category.

Six cases of campylobacteriosis linked to chicken liver

February 8, 2014 in Campylobacter, Restaurant, Temperature Abuse | by Ben Chapman | Leave a comment



Food safety infosheet highlights:

- At least 6 people who consumed raw or undercooked chicken livers, mostly chicken liver pâté have been infected with *Campylobacter* in Washington and Oregon.
- A recent study found that about 77% of raw chicken livers are contaminated with *Campylobacter*.
- Multiple outbreaks of *Campylobacter* infections linked to chicken livers have been reported in the United Kingdom and Australia.



Food loss and food waste

One-third of all food produced in the world is lost or wasted between farm and fork.

The Food Loss and Waste Accounting and Reporting Standard enables companies, countries, cities and others to measure and report on food loss and waste so they can develop targeted reduction strategies and realize the benefits of tackling this inefficiency.

Learn more

DOWNLOADS

FLW Standard Executive Summary (PDF) - ENG | CHI | JAP

FLW Standard (PDF) - ENG

Sample Reporting Template (XLS) - ENG

Guidance on FLW Quantification (PDF) - ENG

FLW Quantification Methodology (XLS) - ENG

Learn to Use The Standard

INFORMATION

Dr. Lisa Kitinoja-The Postharvest
Education Foundation

www.postharvest.org

Dr. Beth Mitcham-UC Davis

<http://postharvest.ucdavis.edu/>



WELCOME TO THE POSTHARVEST EDUCATION FOUNDATION



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Postharvest Educ Fdn
@PostharvestOrg
Direct link: wri.org/blog/2017/10/W...
4h

Postharvest Educ Fdn Retweeted

ReFED
@refed_nowaste
#investing in #foodwaste is smart business and good business. Whether you're driven by returns or #SocialImpact - consider #foodwaste.
Oct 18, 2017

Embed View on Twitter

Globally, postharvest losses and food waste are estimated at 30 to 40% of production. Losses of perishable foods such as fruits and vegetables can be even higher than those for staple foods during the postharvest period, depending on the weather, access to storage or distance from markets. Utilizing improved postharvest practices often results in reduced food losses, improved overall quality and food safety, and higher profits for growers and marketers.

The Postharvest Education Foundation's mission is to provide innovative programs that motivate and empower people to reduce food losses and waste. [Continue reading here.](#)





The Science and Art of Quality and Safety

- Home
- About Us
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- Bookstore
- Certificate Trainings
- Produce Facts
- Postharvest Resources
- Ask the Produce Docs

Welcome

The Center was founded in 1978 by Adel Kader with the goal of organizing and coordinating knowledge transfer regarding reduction of postharvest losses and improving the the quality and marketability of fresh horticultural products. The research findings disseminated during this era by Kader and a cadre of colleagues is the cornerstone and foundation for our current year-round supply and global sourcing of quality fresh and minimally-processed produce and cut flowers.

Our mission today is to remain a leading source of information on quality, safety and marketability of fresh produce and to sustain the viability of the Center for the next generation of scientists and practitioners. Our immediate goal is to broaden the level of involvement among our basic, applied and extension faculty and use the PTC platform to distill, translate, and disseminate emerging technology advancements to a broader industry and affiliated stakeholder audience.

- Produce Fact Sheets
- Storage Recommendations
- Fruit Physiological Disorders



Professional Development Programs

Fruit Ripening & Ethylene Management

April 10-11, 2018 at the UC Davis Conference Center

This workshop, is intended for shippers and fruit handlers (wholesale and retail), and produce managers who are involved in handling and ripening fruits and fruit-vegetables. The workshop focuses on how to increase profits by reducing losses at the receiving end, and delivering ready-to-eat products to the consumer.

YOUR EMAIL:

SUBSCRIBE TO OUR NEWSLETTER



Adequate and proper harvesting and handling of fresh produce are crucial preconditions for long storage and shelf lives (**holding life**) of fruit and vegetables^[4]. Considering the harvesting and subsequent handling stage of produce, the thumb rule of, **the less the better** should be followed, in order to minimize chances of mechanical injuries of produce^[4]. Once damaged, shelf life is considerably compromised.

Harvesting principles:

For harvest procedures the subsequent points are important to consider: choosing the correct harvest time refers to both the ripeness and maturity of the produce as well as the right time of the day. Optimal harvest times for most produce is either early morning hours or the evening when temperatures are lower^[5]

harvesting of delicate, high value produce is best done manually (especially when labor costs are low and fuel costs are high^[4]

do not place produce on the ground directly, but use harvesting mats or containers/baskets instead^[6]

Considering the handling of harvested produce, the following points are important:

Handling:

before being put into storage, produce should be **sorted and graded** with regards to quality (only high quality produce should enter the storage facility)^[4]

produce needs to be **cleaned** (with clean water in order to avoid the spread of molds and fungi) before being put into storage containers and entering the storage rooms. Dirt bears the potential of introducing pests into the storage facility^[6]
time span between harvest and the placement into storage needs to be kept as short as possible^[4]

Transport:

For the transport of fresh produce, the following points need to be considered: trucks, carts, etc. should not be overloaded to avoid damage^[4]

use high quality packaging that will withstand the transport^[4] (Energypedia)



our PARRT"

Good Day
We're Learning
We're
Learning
Learning

ROOSEVELT CREED

My personal best in all
I believe to allow me
to and learn
Working myself, my edu-
cation
Responsibility for my actions
I must own behavior.
I will not let anyone else
blame me for my mistakes.
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blame me for my mistakes.
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blame me for my mistakes.

The big issue in the food industry today is food safety; and **microbial contamination is the number one enemy of the food supply**. Chemical treatments with compounds such as **peracetic acid** are among the most effective methods for control of microbial contamination.

Peracetic acid has the chemical formula $\text{CH}_3\text{C}(\text{O})\text{OOH}$ and is formed in an equilibrium mixture of acetic acid and hydrogen peroxide.



It is almost always used in water solution with acetic acid and vinegar, although the proportions of each component vary from one manufacturer's blend to the next. Peracetic acid has a strong vinegar-like smell around 0.1 ppm but becomes significantly irritating above about 1 ppm. Peracetic acid is a very effective antimicrobial compound, even more effective than hydrogen peroxide.

In addition to being an effective agent against bacteria, any biocidal chemical that will be applied directly to food must not leave any harmful residues. Peracetic acid is very reactive and quickly decomposes to acetic acid (acid in vinegar), oxygen and water. This process is so complete that the Environmental Protection Agency (EPA) regulations exempt peracetic acid residues from tolerances in food products treated up to 100 ppm per application on fruits, vegetables, tree nuts, cereal grains, herbs and spices and with solutions of less than 500 ppm applied to equipment; [1] and U.S. Department of Agriculture regulations provide that peracetic acid may be directly applied to foods that are NOP certified as organic. [2] These features of good efficacy, essentially no toxic residues, easy application (in water solution) and relatively low cost have made peracetic acid an increasingly popular antimicrobial in many food and beverage-related industries. Peracetic acid blends have been approved by the U.S. Food and Drug Administration (FDA) as sanitizer on food contact surfaces (21 CFR 178.1010) and for direct food contact with fruits, vegetables (21 CFR 173.315) and meat, poultry and seafood (21 CFR 173.370).

(Richard Warburton)





-Delivery constrained
economies!

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Succulent, juicy and sweet!
Add to salads, drinks & desserts.
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friedas.com
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0 37842 03768 0

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100% satisfaction guaranteed
Warning: choking hazard
Peel & remove seed
Keep refrigerated
Do not eat seed
Product of Guatemala
NET WT 12 OZ (340g)
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taste.
love.
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Field heat and mobile unit
www.Coolforce.com



Pre-cooling benefits include:

lowering the required workload of a cold storage since optimum storage temperature is reached more quickly

restricting and minimizing **respiratory activity**, thereby conserving the weight of the produce, and **enzymatic degradation** of the produce harvested; thus preventing softening, water loss and wilting

preventing **microbial growth**, such as bacteria and fungi thereby decreasing the rate of decay

decreasing rate of **ethylene production** and the impact on ethylene sensitive produce

delaying chilling injuries for certain fruits

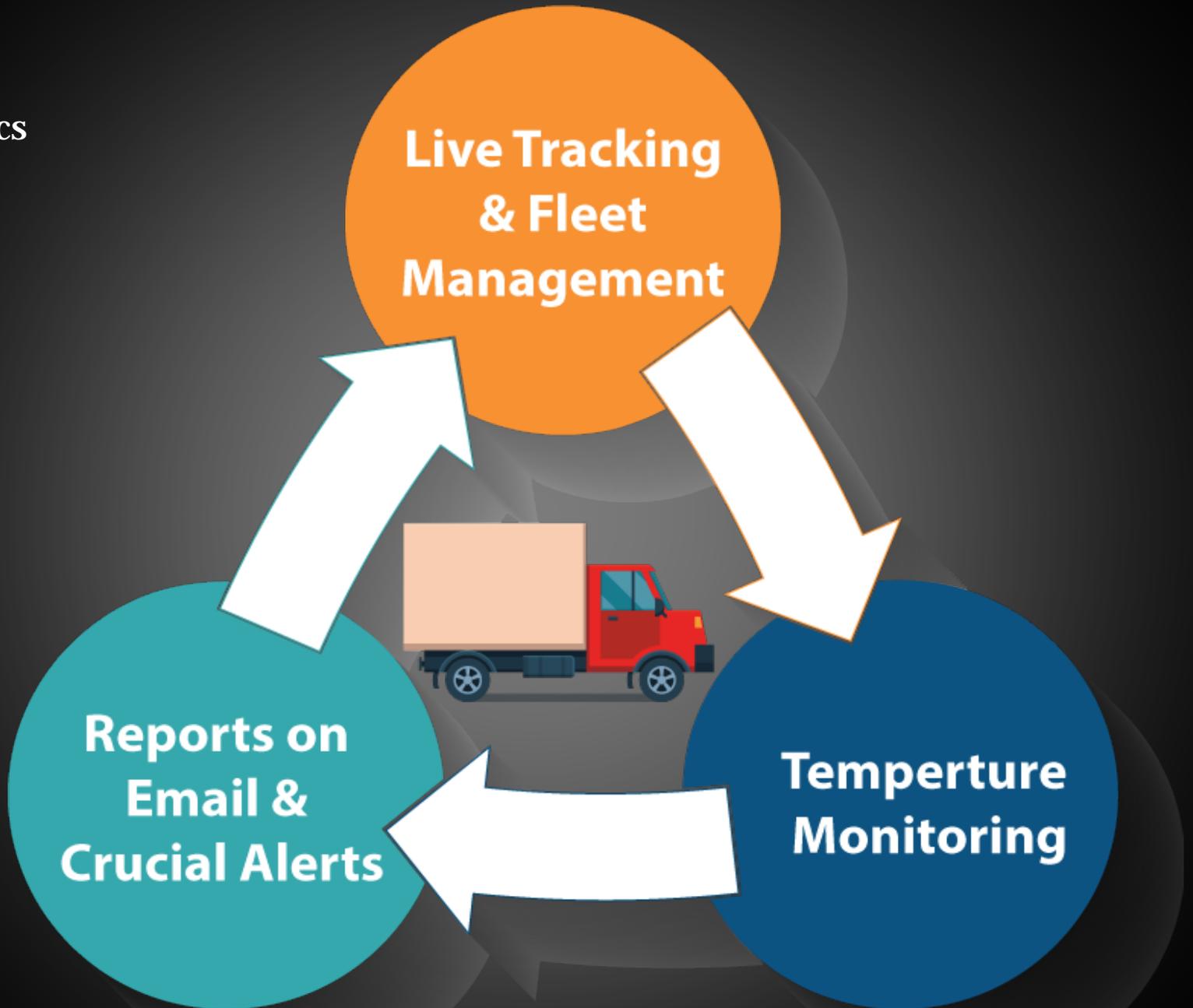
increasing the daily intake into storage facilities which should not exceed 10% of its cooling capacity if produce is not pre-cooled



When is a
box not just
a box? -



Telematics



There are several methods that can be chosen to pre-cool produce. Which method is the most suitable choice depends on various factors of which some are listed below:

Produce characteristics: characteristics of produce, such as chilling sensibility or the need for rapid heat removal, lead to differing cooling requirements making methods more or less suited. Products also differ in their flow capacity; **the faster products can be cooled down, the better.** Some methods cannot be tolerated by some fruits and vegetables, e.g. if they cannot get in contact with water

Packaging: the way produce is being packaged makes precooling methods more or less suitable

Scale: size of operations/amount of produce to be cooled

Efficiency: depending on the circumstances some methods will be more energy efficient than others

Skilled labor: methods require various levels of skilled and trained personnel. The availability of such trained personnel has to be considered

Economic viability: the price of precooling methods differ and have to be considered. This is true with regards to investment as well as **running costs, e.g. electricity.** In general, the cost of the pre-cooling method has to be justifiable with regards to product volume and the increase in product value in order to make economic sense

Regardless of which method is used, the process should always be monitored in order to ensure that precooling is achieved in the most efficient way. Depending on method and product at hand, produce will cool at different rates.

Cool bot technology?



Cost of A/C with CoolBot™ refrigeration installation is about 1/10 that of the cost of commercial systems designed for a traditional small cold room. Designed and commercialized by Ron and Kathryn Khosla, truck farmers in New Paltz, NY.

Refrigerated cold rooms are most useful for storing higher value crops.

Requires a cold room with excellent quality insulation, no air leaks.

Power use estimation: □ 35 kWh/MT for 12°C □ 50 kWh/MT for 2°C

<http://storeitcold.com>

CoolBot

-Temperature
requirements

-Humidity

-Controlled atmosphere

-Ripening

-Safety

Ethylene Scrubber

CARYSCRUB Ethylene Removal Systems

Ethylene removal from the storage and shipping environment of select fruits vegetables and floral industry retards spoilage, reduces the loss and increases profit. This also enables optimum usage of products and resources vice-versa.

Application areas:

Cold storages, controlled atmosphere & modified atmosphere storages, refrigerated containers.



IQF

USDA rules and
regulations-food
safety

9 CFR Part 304

HACCP

CFS  TempoFrost







International Food Defense

In addition to ensuring that domestic and imported products are safe from intentional adulteration, FSIS also supports international outreach efforts on food defense. These efforts help to institutionalize food defense measures and encourage the global recognition of food defense to prevent incidents that could have severe and negative social, economic, and public health implications. The **globalization of the food supply** makes international outreach for food defense a priority for FSIS.

Foodborne bacteria grow rapidly when food is left out on the counter. Room temperatures fall in the "**Danger Zone,**" **between 40 and 140°F**, where bacteria grow rapidly. It is estimated that as many as 9,000 deaths and 6.5 to 33 million illnesses yearly are directly linked to foodborne pathogens (bacteria and other microorganisms that cause illness). And many of these illnesses are caused by food that are left out on the counter at room temperature.

"CHILL: Refrigerate promptly" is one of the four principles of the Fight BAC!® campaign, a public-private partnership of industry, consumer groups, and government, including the U.S. Department of Agriculture's (USDA) Food Safety and Inspection Service (FSIS).

**Cold Chain Association of the
Philippines**

ccaphils.org

Global Cold Chain Alliance

www.gcca.org

**International Affiliation of
Refrigerated Warehouses**

**World Food and Logistics
Organization**



In the face of an emergency, activate the GCCA Crisis Management Go Team for help. [Learn More](#)

37th IACSC
CONFERENCE & EXPO
NOVEMBER 2-4, 2017
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IACSC 2017

CONGRESO
CONGRESO
DE LA CADENA DE FRIO
CONGRESS 2017

CRISIS TEAM

DRIVER TRAINING

How the Cold Chain Makes Sure You Don't End Up on the Wrong Side of "Trick or Treat"

Consumers spend billions annually on Halloween, from costumes and decorations to greeting cards and, of course, candy. In fact, the National Retail Federation estimates that Americans will spend \$2.7 billion this year on Halloween candy. However, the majority of those who celebrate Halloween, which is estimated to be 70 percent of the United States

GLOBAL COLD CHAIN DIRECTORY

GCCA's interactive member directory aims to provide users around the world with a free, convenient way to find third-party logistics providers, contractors and suppliers.

[SEARCH MEMBER DIRECTORY](#)

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The Global Cold Chain Alliance serves as the focused voice of the cold chain industry, representing 1,300 member companies in over 65 countries.

JOIN TODAY

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Food & Beverage
Specialty Practice Group

Upcoming Events

- OCT 26** IARW North Atlantic Chapter Meeting
New York, NY United States
- NOV 1** Air Cargo Americas & SeaCargo Americas 2017
Miami, Florida United States
- NOV** GCCA Webinar: Navigating

8 Ps of Perishable Commodities

Planning – at the farm, collection point, point of sale and end market levels

Product – determination regarding which products are best for which production areas

Price – looking at profitability and efficiencies of production whenever possible

Production – looking at new or improved practices in production to grow and process more product to create more profit while wasting less

Post-harvest – using the best practices during and after harvest in order to assure product is handled properly and reaches markets in the most sanitary, best preserved and most profitable condition possible

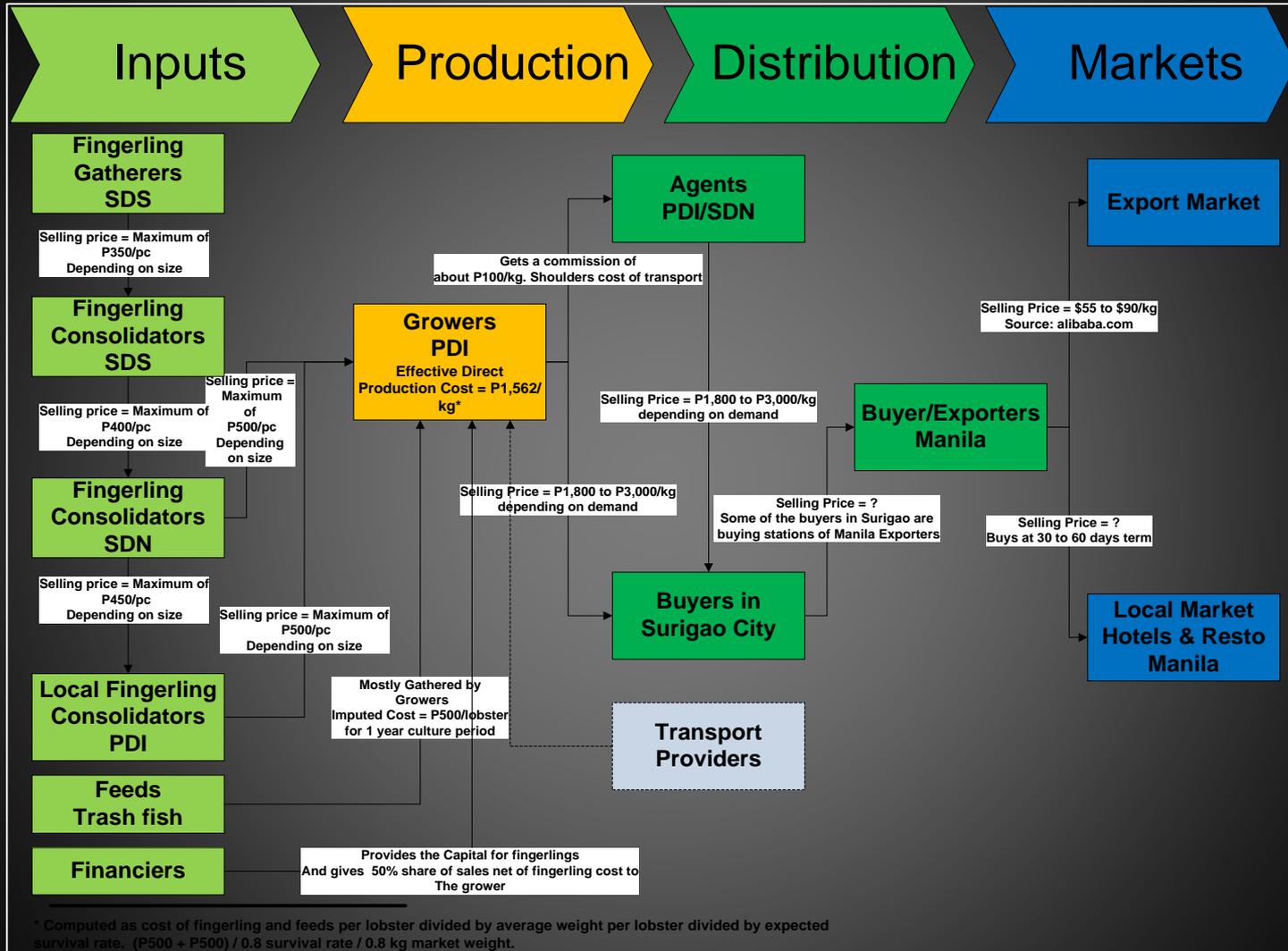
Phyosanitary Practices – assuring that products raised are handled in the best manner possible to assure passage and delivery of a clean and wholesome product and utilizing improved cold chain practices where possible

Promotion – using media, conferences, suppliers, national and international events etc. to promote, brand and expand markets for the region

Policies - working with local, provincial and national governments to create awareness of good policies that improve markets and bring attention to policies that need improvement or are causing problems with improving the market



Lobster value chain example

















Thank you for your attention!

Dan Gudahl

Executive Director

Whiterock Conservancy

www.whiterockconservancy.org

712 292 8640 cell



Whiterock

CONSERVANCY