



APEC Transportation Working Group Project

Identification of competency standards for perishable goods handling skills and development of training programs (TPT 03/2002T)

In-market surveys of training available in a low level (Vietnam), intermediate level (Thailand) and high-level economy (New Zealand)

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October 2003

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Objective

To identify and compare, through in-market surveys, the level of competency and training available for the handling of perishable goods in a developing, developed, and well-developed economies. This will lead to the development of appropriate training aides and programmes for each level of economy.

Method

In August and September of 2003, I was contracted to travel to countries in the APEC region to undertake in-market survey work. These countries were:

- Vietnam (Developing)
- Thailand (Developed)
- New Zealand (Well develop)

In each country, I visited several different companies involved in the handling of perishable goods.

In Vietnam, I visited and met with 15 companies. This was organized by Mr Tra of Professional Logistics Co. Ltd (Prolog). I also visited and observed some fresh markets (wet markets) and supermarkets. During these visits, an interpreter, Mr Huan, accompanied me.

In Thailand I visited three operations - a Tesco Lotus Distribution Centre (for both dry and fresh products), Foremost Dairy Factory and Walls Ice Cream Factory (owned by Unilever Thai Holdings Ltd). These visits were organized by John Kershaw of Linfox, the logistics company which caters for the transportation needs of these companies. The focus of these visits was on the handling and transport of fresh products. The Operations Manager of Linfox, Ken Coulson, accompanied me on each visit.

The original project plan was to undertake a survey in Singapore. The SARS epidemic of 2002-2003 prevented this. New Zealand was substituted as an alternative well developed economy. Data on Singapore has been obtained from the report of the APEC-DTRS Transport Corridor Study.

In NZ, I visited four companies involved with fruit, meat and seafood. These companies were based in and around Napier.

Where possible a description of each company's cool chain operation was obtained as well as the level of competency and training available in the handling of perishable goods (see Appendices 1 and 2). Also, photos were taken where permission was given. These are included in this report.

Major findings

Vietnam

Nearly all of the companies I visited in Vietnam were unaware of any training available in any aspect of handling perishables and particularly cool chain management. This was also the impression of Mr Tra before the visits. It appears that many companies in Vietnam manage their cool chain based on built up experiences and cool chain documents provided to them by consultants (e.g. "Tropical Produce Transport Handbook" from the USDA, 1987). On the whole, cool chain management appears to be very prescriptive and operators follow sets of instructions provided to them without fully understanding the fundamentals. However, there is a strong desire, especially from smaller companies, for formal/certified training. This training needs to be low cost or free to encourage participation.

One of the major constraints on optimising cool chains in Vietnam is financial, as smaller companies simply cannot afford to upgrade their technology or consult experts. For example, fresh fruit and vegetables from the Dalat region are transported several hours (5-6) to Ho Chi Minh City in hot (non-refrigerated) trucks because it is not affordable to use a more developed cold chain.

In Ho Chi Minh there is a Postharvest Technology Institute that has provided training courses on quality assurance for fruits. This Institute could provide a mechanism for further training specifically on cool chain issues. Any training provided in Vietnam would first need consultation with the Agriculture and Rural Department of the Government.

Training provided to companies in Vietnam should encompass the following topics:

- Importance of the cool chain for fresh goods
- Low technology cool chain solutions (e.g. use of eutectic ice blankets)
- Fundamentals of cool chain management
- Coolstore management and logistics
- Handling and packaging of foods
- Identification of optimal storage conditions (esp. temperature) for specific products especially sub-tropical crops
- Effective management and maintenance of refrigeration systems (coolstore and transportation)
- Different methods of cooling fresh produce
- Controlled/modified atmosphere storage
- Quality assurance systems

Thailand

From the discussions that were had, cool chain management in Thailand is regarded as a young industry. Thailand has a mix of cool chain solutions. Much of the food is still handled through the traditional wet markets that have poor handling, packaging and cool chain practices. However, the investment that has been made in Thailand by large multinational companies has brought with it good handling, packaging and cool chain practices. All three

companies that were visited had very good cool chain systems and transportation operations and were operating at a level above Vietnam. There were no major problems identified.

The Tesco DC provides regular in-house training for its logistics/transport team with courses like 'Logistics and Supply Chain Management' and 'Transport Planning and Development' offered. Walls and Foremost also provide some on-the-job house training but no structured courses. Unilever is also willing to bring in consultants and send staff abroad for training. This is a luxury that smaller companies are probably not in a position to afford. Like Vietnam, the companies visited in Thailand were not aware of any external training available for the business. An Institute of Technology exists in Bangkok and offers postharvest courses but not for practitioners.

The focus of training for Linfox is very much on health and safety (especially of the drivers given the high road toll in Thailand). There is the Asian Institute of Technology in Thailand that provides post harvest technology courses but only at the postgraduate degree level, so is not appropriate for practitioners.

New Zealand

Generally, the companies visited in NZ all had good coolchain management. This is necessary because of strict food safety regulations in that country and those of its trading partners. Internal and external auditing of food handling practices is especially prevalent. Such internal regulation is less apparent in less developed countries. Each company regularly monitors temperature through the coolchain with corrective action taken when necessary. The monitoring of coolchain temperatures in less developed countries is not as rigorous.

Like Thailand and Vietnam, training of staff in NZ is predominantly in-house. The grocery supermarket I visited in particular had a good training program in place that was very much driven by food safety requirements. Several tertiary and technical institutes provide courses encompassing the handling of perishables but courses available for practitioners seem to be lacking.

Singapore

In Singapore the application of cool chain principles and associated handling procedures was found to be mixed. Handling of product was mixed, particularly utilisation of palletisation, where out of three companies surveyed one used pallets, one used bulk stows and another used both pallets and bulk stows depending on the client¹.

Singapore has a well developed economy and has good cool chain infrastructure in place. Government regulation surrounding food safety are more stringent than in either Thailand or Vietnam and this has forced investment in infrastructure and changed cool chain handling practices over the last decade.

Staff training within Singapore's food distribution industry is mainly in-house. It was reported that of the three companies survey in the transport corridor study that all had in-house

¹ Sourced from the report of the APEC-DTRS Transport Corridor Study

training courses for staff, however the effectiveness of this training was not checked. Further, one of the companies undertook no training for fresh food handling.

Benchmarking of cool chain systems in the different economies

Multi-national and local/national companies in the higher-level economies appear to have very good coolchain systems, especially the larger companies which have invested significantly in their infrastructure. Consequently, the quality of perishable foods tends to be good in these economies.


In lower-level economies, multi-national and large local/national companies, especially exporters, appear to have very good infrastructure but the quality of fresh foods can be poor. This is mostly due to production problems and poor quality at harvest. Smaller companies seem to have limited infrastructure and know-how, which contributes to poor quality foods. Poor handling practices (e.g. poor stacking and collapsed packaging) were evident in some of the smaller companies.

Coolchain practices in the lower-level economies seemed very prescriptive with an apparent lack of training and understanding in coolchain management. While companies offer basic in-house coolchain training, external training appears non-existent at the practitioner level (this also seems to be true of the higher-level economies that were visited). There is certainly a strong desire amongst companies in less developed economies for additional training in coolchain management.

A comparison of the different economies is presented in the following tables.

Comparison of local/national companies in different economies.

Level of economy	Country	Overall coolchain system	Overall product quality	Main coolchain features
High ★★★	New Zealand			<ul style="list-style-type: none"> • Very good on the-job training and handling practices especially for fresh products which require careful postharvest handling and storage due to the propensity to mechanical damage; • Strict food safety regulations in NZ require excellent quality control systems; • Very good cool chain infrastructure exists including large static and controlled atmosphere storage facilities for produce; • Very good awareness by staff of the perishability of fresh products and the need to handle carefully. • Rigid packaging exists particularly for product that is exported long-distances. • Limited external training available for practitioners; higher-level tertiary training available.
Medium	Thailand	Only multi-nationals were visited (see following table)		
Low ★	Vietnam			<ul style="list-style-type: none"> • Little or no on-the-job training available; no significant external training available for practitioners; • For smaller operations, coolchain practices rely heavily on prescriptive documentation provided by international expertise; • There were examples of collapsed cardboard packaging at the smaller businesses, probably due to poor handling and storage conditions (too moist); • Smaller operations limited infrastructure. The large Hoang Lai coolstorage facility was the exception with large capacity and modern technology including forklifts, dock levellers and air-bag curtains. • Lack of infrastructure illustrated by the use of "hot" non-refrigerated trucks and large street markets that lacks any apparent cooling or packaging of produce. • Variable hygiene measures from very good (for exported product) to poor (locally consumed product).

 **Very good** Good Poor

Comparison of multi-national companies in different economies.

Level of economy	Country	Overall coolchain system	Overall product quality	Main coolchain features
High ★★★★★	New Zealand			<ul style="list-style-type: none"> • Good in-house training provided. Countdown (Progressive Foods Ltd) provide staff with clear documented instructions for handling of the different types of product and very good food safety videos; • Again, limited training available for practitioners; • Very good awareness by staff of the perishability of fresh products and the importance of careful handling and storage practices; • Robust packaging exists particularly for exported product that is often transported large distances. • Sound packaging required for products sold locally necessary to comply with strict food safety regulations.
Medium ★★★	Thailand			<ul style="list-style-type: none"> • Very good on-the-job training e.g. Walls Ice cream (Unilever) operate competitions to maintain high level of skill. • Very good fleets of refrigerated transport particularly Tesco. Unilever Walls run older fleet of smaller trucks and requires upgrading. • Excellent infrastructure with the latest coolstorage technologies in place; • Local food product delivered in rigid crates but high quality control upon receipt; • Good packaging construction and integrity. No examples were seen of collapsed or damaged product.
Low ★★	Vietnam			<ul style="list-style-type: none"> • In-house training limited and additional up-skilling is very much desired by staff; • Very good infrastructure and storage facilities for perishable goods; • Some poor quality product evident (e.g. produce in Metro) probably due more to poor quality at harvest rather than subsequent coolchain management;



Very good

Good

Poor

Acknowledgements

I would firstly like to thank Mr Tra and Mr Huan for facilitating my visits in Vietnam. I would also like to thank John Kershaw and Ken Coulson of Linfox for organizing visits in Thailand. Finally, I would like to show my appreciation to all the people in Vietnam, Thailand and New Zealand who were able to meet with me.

Appendix 1. Descriptions of each company visited in Vietnam.

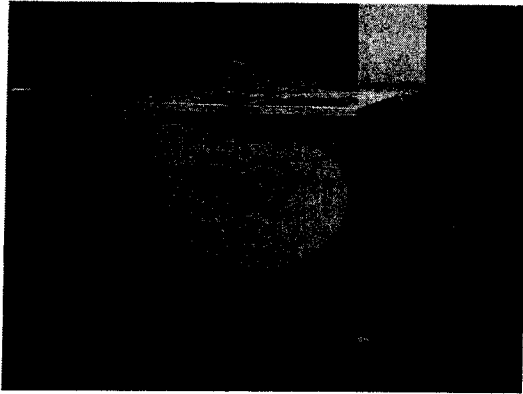
Kido's Ice Cream Corporation

Company Description

Primarily an ice cream manufacturer and distributor. Currently operating under the Walls brand but changing shortly. Employs 300 staff and distributes to 4000 outlets. Ice cream is stored and transported @ -18°C.

Kido's coolstore facility in HCMC and examples of its fleet and containers which are delivered to stores





Training Comments

In-house training is provided to staff and retailers. Staff follows a prescription and lack understanding of cool chain importance. Current cool chain technology is adequate but information on new technology would be appreciated. Certified training of cool chain management would be desirable.

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Dnin Hao - Imported Beef, Lamb & Fresh Fruits

Company Description

Small private enterprise established in 2002 dealing with fresh meat (beef and lamb) and fruits imported from the US and Australia. Fruit is only imported on request. Operation consists of one small coolroom (see photo below). Several products are often stored together. Company employs five staff – a manager, accountant, salesperson and two delivery people.

Small companies like this are common in Vietnam.

Small coolroom operated by Dnin Hao.



Training Comments

No formal training has been provided for the operation of the coolstore but is desirable. Operation is experience-based and prescriptive (from documents).

The Vietnamese market is often flooded with fruits and vegetables that must all be sold quickly as they are perishable. Controlled atmosphere storage would allow the marketing window to be widened. Training in this area would be beneficial.

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Seafood Joint Stock Company No 1 (Seajoco Vietnam)

Company Description

This company, which is 20 years old, purchases seafood directly from farmers then packages and freezes it for export to the US and EU. 600 people are employed in two factories.

Training Comments

No training available for their operation but is desirable especially for temperature management and coolstore engineering.

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Anh Hong

Company Description

Anh Hong is a bakery that was established in 1995. It specializes in the production of flan cakes. A total of 100 people are employed – 40 factory staff and 60 office staff.

A small coolroom is utilized at the factory to store product prior to shipping.

Training Comments

No formal training has been provided in either packaging or coolstore management. Training would be useful in temperature control and the identification of optimal storage temperatures.

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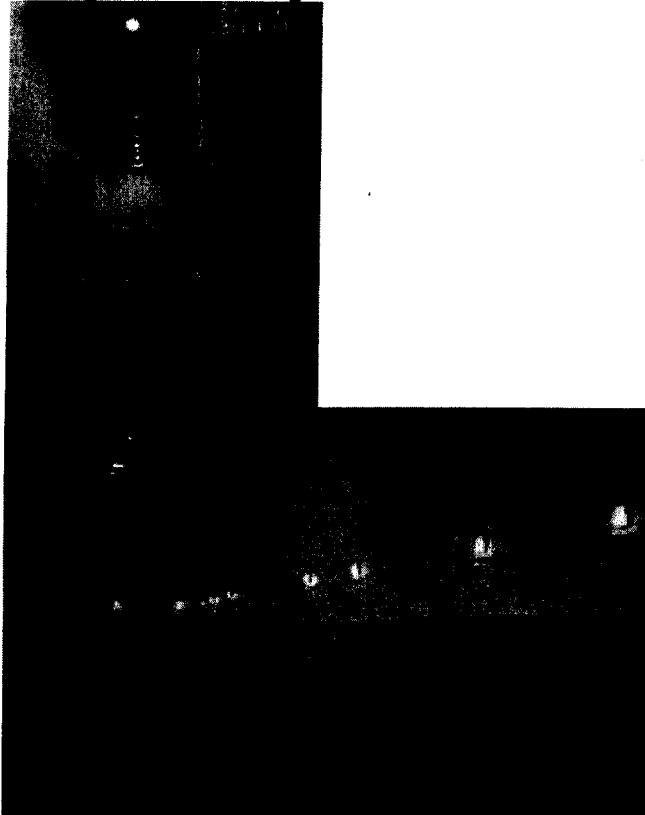
Hoang Lai ColdStorage (HLCS)

Company Description

HLCS belongs to Hoang Lai Import-Export Co Ltd and provides a full coldstorage service for various goods such as seafood, agricultural products and other temperature sensitive products. Operation of the facility is managed by Professional Logistics Co., Ltd (Prolog). In addition to temperature controlled warehousing, Prolog provides a transportation service as well as distribution and value-added services e.g. customs-clearance and product launching support.

The facility is built with the latest technology and comprises 15 separate coldrooms each accommodating from 200 – 2000MT. It's 4 layer racking system can accommodate up to 1500 pallet places. The high ceiling (8 meters) ante-room prevents fluctuation of temperature during loading/unloading process. Docks with leveler, air-bag curtain are all equipped to ensure the temperature stability for loading and unloading processes. The dock size allows receiving various sizes of vehicles from 40 feet reefer container to normal trucks. Besides the stable power supply from the national grid, there is a standby generator to ensure 24/24 hours back-up of blackout. The temperature of the coldstores and ante-room is measured and recorded by PC. Auto-Alarm is set to safe guard on 24/24 basis. The temperature can be set down to - 30oC. 40 people are employed in the coolstores with an additional 10 office staff and 10 drivers employed. HLCS has ISO 9001:2000 certification.

Hoang Lai ColdStorage facilities



Training Comments

Management of the facility is experience-based and prescriptive i.e. various coolstorage documents are utilized. Training has been limited and there is a lack of understanding of the fundamentals for coolstore management. Some in-house training is provided. Training required for providing optimum storage conditions for specific tropical crops. Any training

must be free to encourage participation.

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Vinafruit (Vietnam Fruit Association)

Company Description

Vinafruit is a non-governmental association that was established in March, 2002. The Association specializes in exporting tropical fruit from Vietnam. Its objectives are to mobilize exporters in order to develop the export of tropical fruit in response to the increasing demands of the international market and to help improve the quality, variety and range of products through the provision of training, research and technical assistance and through collaboration with foreign parties (see Vinafruit website for more details).

Vietnam Fruit Industry facts:

- currently 0.5 million hectares of fruit production in Vietnam (300,000 hectares in the South). Government wants to grow this to 1 million hectares by 2010.
- 4-5 million tones of fruit produced per year in Vietnam (3 million hectares in the South)
- exports from Vietnam are small because of high production costs and significant losses; only 3 – 5 % of fruits and vegetables are exported with 5 – 7% processed.

Dragon Fruit (or cactus apple).



Training Comments

Training and financial assistance is required for the development of Dragonfruit (see photo below) which is considered an important fruit for Vietnam. Further research and training is required to reduce production costs, increase quality and reduce losses. Any training provided to farmers needs to be hands-on to have any impact.

There is a need to improve the level of postharvest technology in Vietnam to increase fruit quality, extend the shelf-life of fruit and decrease losses. More sophisticated postharvest facilities (e.g. Pilot Packhouses for Dragon fruit) are required to create a positive impression to encourage International interest. Existing facilities are basic. Transferring technology to farmers has been difficult due to their isolation (e.g. poor roads).

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Post-harvest Technology Institute (PHTI), Ho Chi Minh City

Company Description

The PHTI was established by an old version of the Ministry of Agriculture and Rural Development. It comprises over 100 engineers and doctors of different specialization.

The goal of PHTI is to produce and disseminate new technology that will reduce post-harvest losses, expand markets for agricultural commodities, and generally increase farmer income. The technology is intended to serve the needs of small- and medium-sized farmers.

PHTI is composed of two centers; the headquarters in the north (Hanoi) and a center in the south (Ho Chi Minh City). Although PHTI/North and PHTI/South are administratively linked, the research and extension activities of each are distinct and relatively independent.

Main Activities of PHTI:

1. Study and transfer of technologies for storage, processing of food, foodstuff, fruits and vegetables.
2. Analysis of aflatoxin and [pesticide residues in vegetables, fruits, agro-products and food by rapid biological methods.
3. Consultation and training on postharvest technologies.
4. Development of relationships with specific organizations and International Economic Programs such as ACIAR.

Training Comments

- Has focused on training to develop a capable team to fulfill its activities.
- National seminars on the production and storage of dragon fruit were held in 1999 and 2000.
- Australian experts have provided training courses for institutes, universities and provincial extension centers on quality assurance systems for fruit.
- British and Vietnamese experts have provided training on fungi and mycotoxins in food and agro-products.
- Further training is required in Vietnam to improve quality and reduce losses through appropriate harvest and storage strategies.

Contact Details

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METRO (Cash & Carry Veitnam Ltd)

Company Description

This wholesale hypermarket was opened in 2002 by Germany's Metro Group, the world's fifth-largest trading company. It is one of 8 Metro stores throughout Vietnam. Metro's strives to supply large volumes of low price, high quality products. Presentation and assortment of products is important.

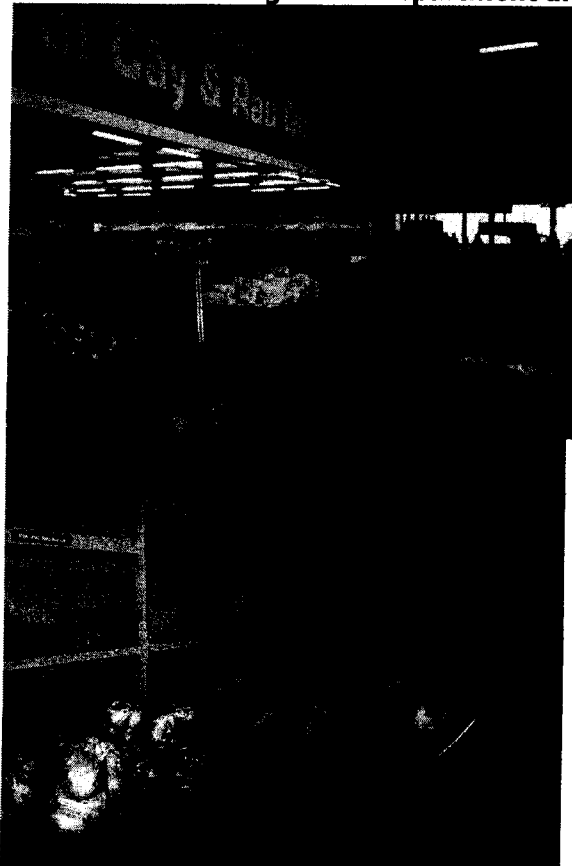
This store has 5 fresh food departments: bakery, meat, fish, fruit and vegetable and milk/dairy. One small coolstore is dedicated to all fruits and vegetables (set at 10 – 15°C), with other small rooms dedicated the other fresh foods.

Training Comments

The quality of fresh foods supplied to METRO in Veitnam is often poor quality and not acceptable for export. Training is required throughout Vietnam to improve the quality of fresh foods – pre and postharvest. This will require financial assistance.

Within Metro, managers of the fresh food departments lack training in the storage of perishables. However, it seems that Metro are not willing to pay for external training.

Metro Fruit and Vegetable Department and Coolstore



Contact Details

Mr Le Thai Thanh, Food & Fresh Food Co-ordinator
An Phu
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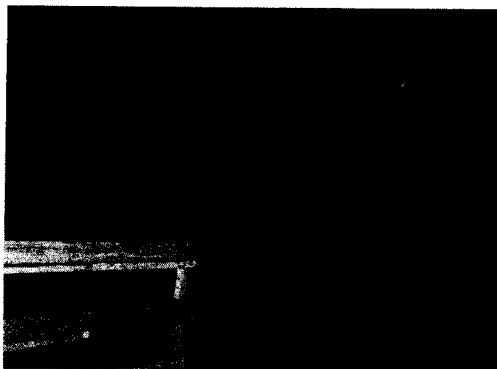
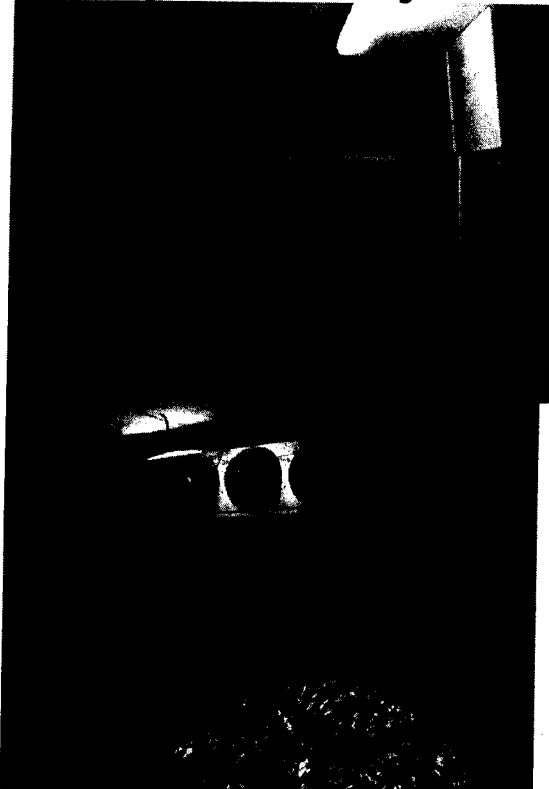
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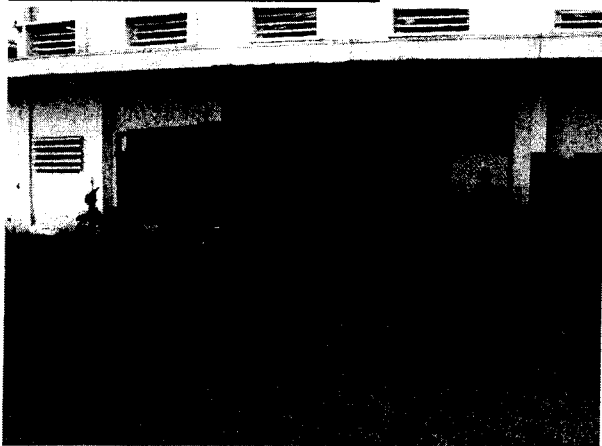
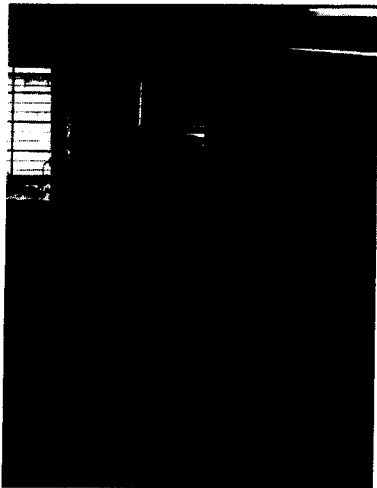
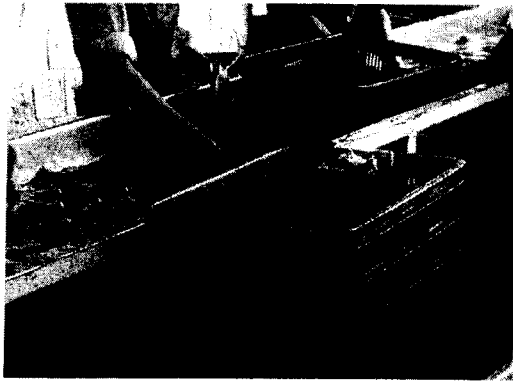
Company Description

This company located in Dalat has a total of 260 hectares of nutritious land that it utilizes for grazing of cattle and the production of vegetables. Vegetables produced include broccoli, pumpkin, corn, sweet potato, radish, bean, eggplant, potato, zucchini, chili, pepper, asparagus and cucumber. 100 hectares of land is equipped with a complete irrigation system to offer water supply all year round for the crop rotation of the Company.

In summary, the vegetable operation consists of harvesting, pre-cooling, washing/selection, coolstorage and transportation. Vegetables like broccoli and corn are pre-cooled from 30°C in the field down to 2°C (1 ton in 20 minutes). Static storage is at 10°C. The company operates cold trucks for vegetables like broccoli and corn, and hot trucks for vegetables like sweet potato.

Coolstorage facilities and vegetable handling at the Green Mountain Company





Training Comments

One of the major problems the company experiences is the sprouting of root vegetables during storage. Training to alleviate this would be invaluable. Also, training on the effective use of refrigeration systems would be useful.

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Vietnam Dairy Products Company (VINAMILK)

Company Description

Vinamilk was established in 1976 has grown to become the leader in the milk processing industry.

With a diversified range of dairy products, Vinamilk now has more than 90 products including sweetened condensed milk, powder milk for babies, children and adults, nutritious cereal powder, biscuits, UHT milk, Soya milk, ice-cream, yohurt, cheese and fruit juices. Vinamilk exports to several markets globally, including the USA, Asia and Middle East countries (www.vinamilk.com).

Training Comments

Vinamilk is consistently delivering high quality products to its customers with no significant problems. In-house training is provided to those involved with the coolstorage of products including drivers. The need for further training appears minimal. However, training to improve temperature control would be considered useful.

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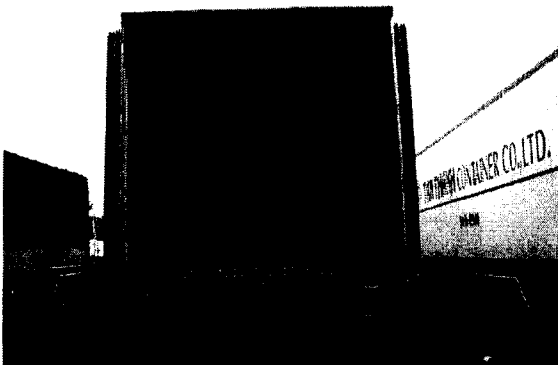
Transportation Company No. 2

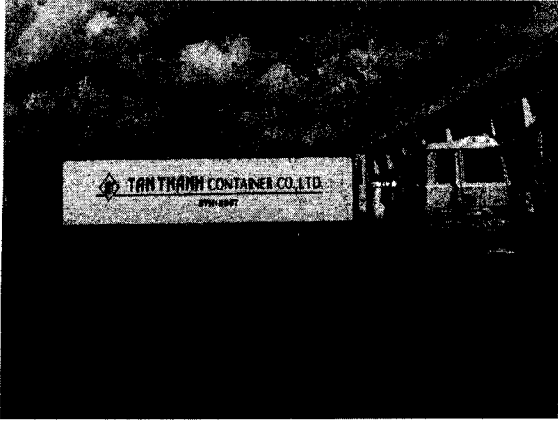
Company Description

As the name implies, this company is involved with the transportation of products, both hot and cold, throughout Vietnam. It operates a fleet of 600 trucks (including 50 cold/refrigerated trucks) and employs 1000 drivers and 40 office staff. Cold trucks transport fruit and vegetables while hot trucks transport anything that does not require chilling including motorcycles and cars.

One of the major challenges with the cold trucks is the effective cooling of produce collected directly from the field. With the current cooling systems, it can take 1- 2 days to cool the fruit from ambient (25 – 40°C) to 3 – 5°C. Shrinkage occurs during this time.

Examples of cold trucks operated by Transportation Company No. 2





Training Comments

Technical training is desired for the effective control of temperature in cold trucks. Further knowledge is required to minimize shrinkage during the cool down period.

Contact Details

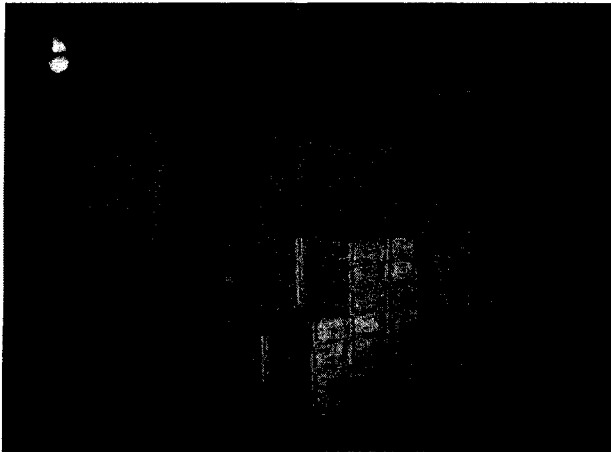
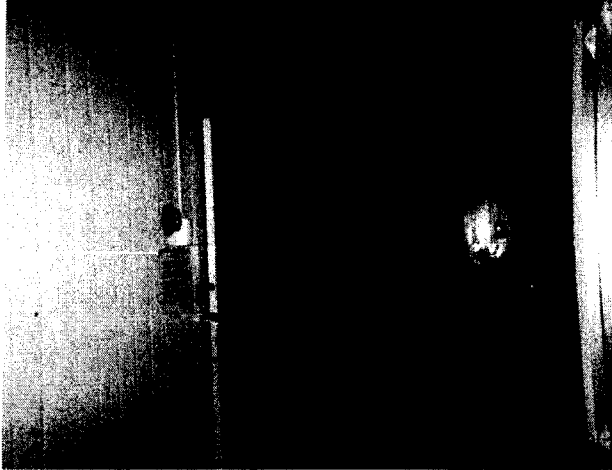
Mr Ngo Van No, Manager

Trang Nguyen Trading & Services PTE

Company Description

This small operation is in the heart of Ho Chi Minh City imports fruit from Australia, Hong Kong, and Thailand, then sells it domestically. Kiwifruit, apples, citrus and grapes are amongst their imports. The company employs 30 people and operates three small coolrooms and three refrigerated trucks.

Trang Nguyen Coolstores



Training Comments

Current practices are based on advice provided directly from international consultants. No training seems to be available in Vietnam for staff. The manager has a strong desire to learn and be trained so as to improve storage operations.

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Company Description

This small company imports and distributes fruit to wholesalers and retailers. It employs just 10 staff and leases and operates 2 small cool rooms (each 1000m³ running at 3 – 4°C). Several types of fruit are stored in each room including apples, grapes and oranges.

Inside Cac Lim coolstores



Training Comments

Coolstore practices are based on documents and experience. No formal training has been provided or seems to be available. Training required in all aspects of temperature management. Hot trucks are used to transport some products (e.g. oranges) as this is affordable.

Contact Details

Ms Do Bich Nga

Angst-Truong Vinh

Company Description

This is two companies: Angst-Truong Vinh (ATV) and Truong Vinh (TV). ATV is a Vietnam-Swedish owned joint-venture company involved in the processing of meat. Employs about 45 staff. Products include pork, chicken, ham, bacon and sausage and are all consumed domestically. Raw material is sourced from the surrounding provinces of HCM and transported by refrigerated trucks. After cutting, steaming and moulding, meat products are frozen (and smoked) then cool stored. Product is transported using refrigerated trucks. TV is a seafood company that exports 100% to the EU. It is involved in just the packing and exporting of product and therefore requires a staff of only 7.

Training Comments

Only in-house training has been provided from Sweden for the business.

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Dalat Agri Food Company

Company Description

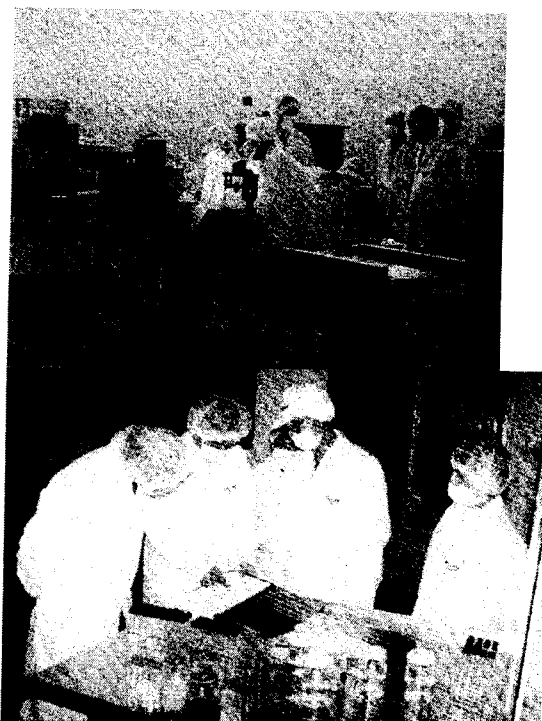
This company processes fresh and frozen vegetables for domestic use and the world market. It is located in Dalat, Vietnam, an important area of high-class vegetable production. Dalat is located 1,500 meters above sea level and has an annual average temperature of between 18 and 20°C. Dalat is one of the few places where vegetables can be grown year-round. The yield of vegetables from this area is 3-500,000 tons per year.

The processing factory is located in the heart of the vegetable growing area and is equipped with modern equipment from Europe. Supervision is by experienced international engineers and specialists. Hygiene practices are excellent.

In summary, processing of the raw vegetables consists of washing, blanching, water-cooling then freezing (at -31°C). Subsequently, the frozen material is stored and transported at -18°C.

Processing operation at the Dalat Agri Food Company





Training Comments

The factory equipment and operation is of the highest standard. The factory consistently delivers high quality product to its customers. Cool chain training does not seem necessary. Methodology for processing each vegetable seems to be provided by the customers. Some quality control (QC) training would be desirable.

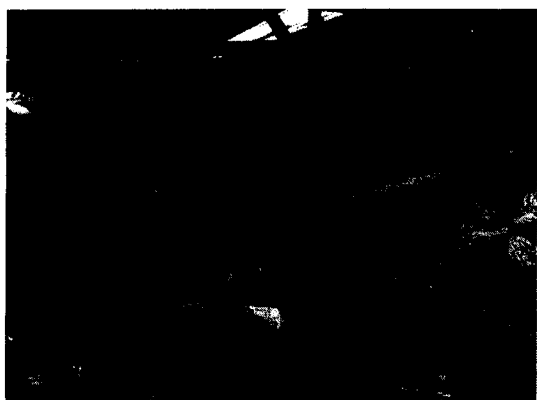
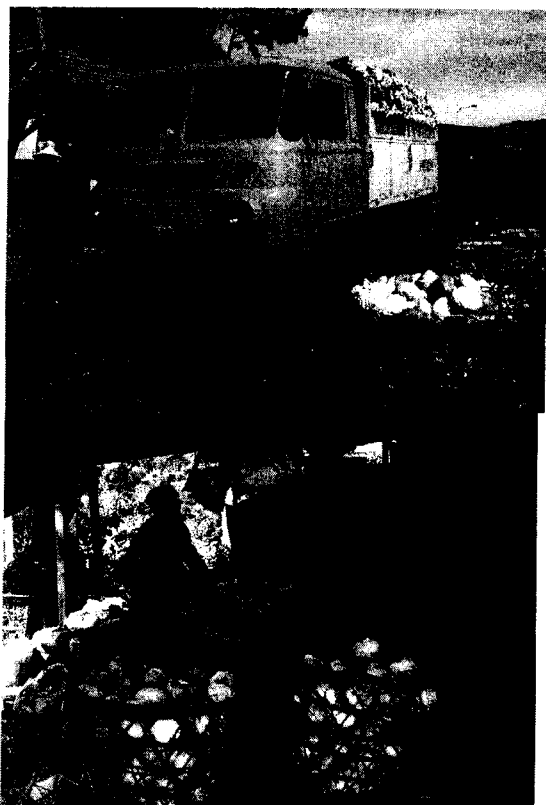
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Vegetable and Fruit Collectors (in Dalat)

Collectors collect and transport fruits and vegetables from the Dalat area to the rest of Vietnam. Hot trucks are used for the transporting as refrigerated transportation is too expensive. To minimize deterioration of produce, transportation occurs primarily at night. Leafy vegetables such as cabbages may be wrapped in newspaper to minimize damage. They are not cleaned before wrapping while root vegetables are.

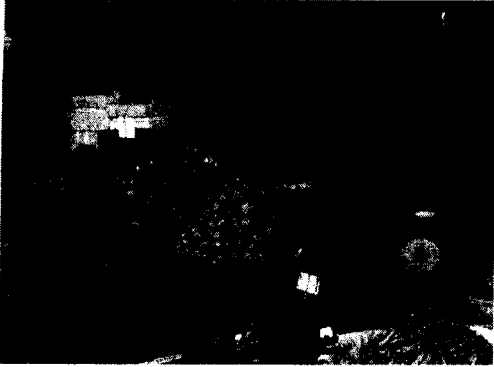
Hot truck and handling practices of vegetable collectors in Dalat

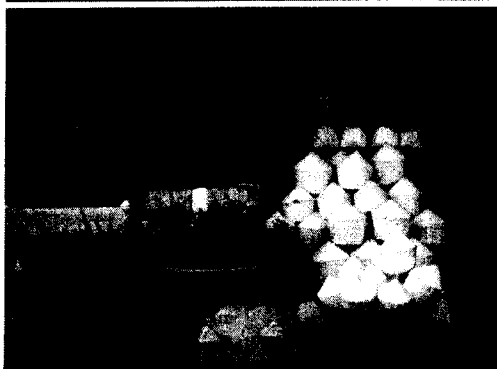


Dalat Markets

In addition to visiting companies in Dalat region, a visit was made to the fresh markets in Dalat City. Below are some images captured from the market.

Examples of fresh produce in the Dalat fresh markets





Appendix 2. Description of each company visited in Thailand.

Walls (Unilever Thai Holdings Ltd), Transportation – Bangkok

Company Description

Linfox manage the transportation of Ice Cream products from this Walls Factory. Product is delivered to 15,000 outlets within the Bangkok area using 21 trucks (10 pickups and 11 six-wheelers). The fleet is an older one and Linfox would like to see it upgraded but this requires Investment from Walls. 21 drivers and 21 assistants operate the trucks. Transportation occurs 24 hours a day, 6 days a week. In a typical day, a driver handles 9 loads while at night, 12 loads. Trucks employ a cold plate system operating at -33°C . Although Ice Cream only requires -18°C , Walls believe that the lower temperature will overcome heat gain caused by the regular opening and closing of doors during delivery. The cold plate system provide 12 hours of refrigeration before recharging is required.

Training Comments

The manufacturing side of the Walls Company have an excellent framework established for in-house training. The Human Resources team regularly undertake GAP analysis and provide in-house training to meet any shortfalls. They also have in-house competitions to keep staff motivated. The same cannot be said for the transportation part of the business. That said Walls consistently deliver high quality product without any problems. While no training courses are available for the transportation team, Unilever provide cool chain management documents for their staff and will send staff abroad for training.

For safety, Walls have in place Total Protective Maintenance (TPM) and Good Handling Practice (GHP) programmes.

The emphasis of Linfox's training in Thailand (this applies to all companies) is on driver safety. This is because of the high death tolls on the roads.

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Company Description

Foremost is a milk and yogurt producer, which has been leading the market for more than 30 years. It dispatches product to Bangkok and up-country. Linfox provides transportation with 101 staff employed and 31 modern trucks operating (20 pickups and 11 ten-wheel trucks). Transportation occurs 24 hours a day. Cooling in the trucks is provided by Thermo King airflow systems.

Range of Foremost products



Training Comments

Effective temperature management is critical for delivery high quality product. The current operation has yet to experience any problems. Training seems unnecessary here.

The focus of any training in this operation appears to be on driver safety.

Interestingly, some training would be desirable for improving the way that staff load and unload products to prevent injuries (e.g. back problems).

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Tesco Lotus, Distribution Centre (DC)

Company Description

This large warehouse is the largest of its kind in South-East Asia. It consists of a DC for dry products (approx. 60,000m² floor area) and a DC for Fresh products (approx. 10,000m²). It distributes to 54 Tesco stores throughout Thailand.

The DC utilizes 70 trucks from Linfox and 18 trucks from other sub-contractors. Transport occurs 24 hours a day with 209 drivers employed. On average, 130 loads are delivered to Tesco stores each day.

The Fresh DC consists of 3 distinct areas. Firstly, product is delivered to the receipt area, which operates at -12°C for seafood, -5°C for frozen food and 12°C for fresh fruits and vegetables. A quality assurance team works here to ensure high quality product is received. The second area, is the cross-docking area where product is stored for short amounts of time until pickup from the dispatch area.

The transportation of fresh products involves 4 forty-foot containers, 27 ten-wheel trucks, 4 semi-trailers and 10 dock trailers. Each trailer has 2 temperature sections separated by a curtain - 1°C at the front and 8-14°C at the back. This allows full loads.

Training Comments

In-house training is provided for logistics management with courses like 'Logistics and Supply Chain Management' and 'Transport Planning and Development' offered. Some in-house training is also provided for the handling of fresh products. The DC operation is excellent and the need for external training seems minimal.

The DC has a vendor development team that regularly liaises with vendors to ensure the highest quality product is provided.

For further information about any of the previous operations in Thailand please contact:

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Appendix 3. Description of each company visited in New Zealand.

Countdown Grocery Supermarket, Napier

Date: 1 October 2003

Contact: Craig and Paulette, Fresh Foods

Countdown supermarket is owned by the Progressive Enterprises Limited (PEL) which holds approximately 45% of the New Zealand grocery market (for more information visit: www.progressive.co.nz). PEL is part of Foodland Associated Limited (FAL), one of Australia's largest publicly listed companies.



This Countdown store employs a total of 130 staff. The number of people working with fresh foods is as follows:

Department
Number of staff

Service delicatessen
15

Butchery (fresh meat)
10

Storerooms
2

Seafood
6

Service meats
4

Produce (fruit and vegetables)
8

Total

Countdown uses a temperature probe and non-contact infrared gun to monitor the temperature of its products. All temperature instruments are calibrated and sanitised regularly (the methodology is provided in manuals). Product temperature is checked and recorded on delivery and twice daily, at least 5 hours apart. Each type of product has a specified temperature that it must not exceed upon receipt (see following table).

Product Type
Maximum Acceptable Temperature

Meats/Deli
4 – 10°C

Dairy
4°C

Salads
4°C

Frozen
-18°C

Prepared foods (e.g. fish, soup, sushi)
4°C

Each department has 1-2 small chillers for the storage of small quantities of food. The store receives food daily so there is no need for large chillers. The temperature in chillers is checked twice daily. Specifications are provided for the way that product must be stacked in chillers (e.g. minimum of 200mm above floor, not against walls).

Appropriate action is taken when product or chillers does not meet temperature specifications.

Countdown rigorously monitors product temperature to optimise quality and avoid any health concerns. All low-level staff requires in-house training from managers. Comprehensive videos and manuals are provided for staff on food safety and temperature monitoring. Managers receive external training and food safety certification from the Ministry of Agriculture and Fisheries (MAF). Countdown's practices are audited twice a year by Telarc Limited (for more information visit www.telarc.co.nz).

Johnny Appleseed Group of Companies, Hastings

Date: 1 October 2003
Contact: Paul Paynter
Phone: +64-212428264

This fruit business was established by the Paynter family in the 1870's in Nelson, NZ. The family subsequently purchased land in the Hastings region. Originally just growers, the Paynter family became frustrated with the postharvest sector and set about developing its own postharvest capabilities. They believe this integrated approach offers much greater control of the quality, supply and marketing of fruit after harvest. The Johnny Appleseed Group is of the view that other postharvest operators are logistics operators and compromise quality for volume throughput.

The Johnny Appleseed postharvest operation occupies 11 acres of land that was previously orchards. The company also has 260 hectares of cropping land. Although Johnny Appleseed is not a commercial packer, it does pack fruit from nine other growers (the company pays a set price for this fruit and markets it as it's own fruit thereby taking ownership of all the risks/benefits). The Johnny Appleseed group markets if fruit under the "Yummy" brand (for more information visit www.yummyfruit.co.nz).

Johnny Appleseed handles mostly pipfruit and stonefruit. The company's main product is apple and handles 22,000 bins in a season (each bin contains 410 kg of fruit). On site, there are 4 large air coolstores which each handles about 2,500 bins of fruit. There are also several small controlled atmosphere (CA) rooms. These are smaller and more expensive than those found at other postharvest facilities but they are more efficient and flexible to use. The CA rooms double as precooling rooms at the beginning of each harvest season. To cope with its total volume of fruit, Johnny Appleseed rents both air and CA storage at other Postharvest Facilities.

The company requires all fruit to be delivered and placed into appropriate coolstorage conditions on the day that it is harvested. Cultivars that require pre-cooling (e.g. Royal Gala) are done so overnight immediately after receipt. Temperatures in each room are logged automatically each day. The temperature of fruit is also checked twice a week using hand-held temperature probes. The product is subsequently transported in 40-foot containers on ships. These have a low refrigeration capacity and so it is important to ensure fruit is appropriately cooled before going into the containers. Temperature of the product is checked just prior to loading out. During transit, shipping companies regularly monitor the temperatures in containers. Johnny Appleseed also inserts temperature probes into each container as an independent check of temperature. The temperature of fruit is checked by customers on receipt who report this information back to Johnny Appleseed.

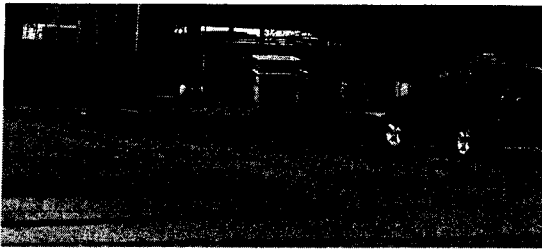
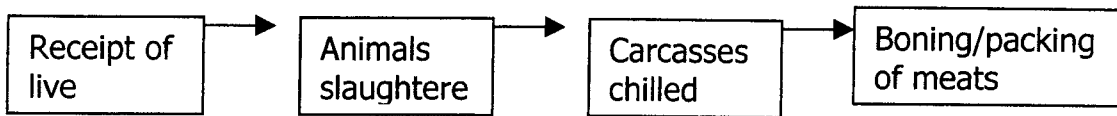
In-house training and operating manuals are provided to staff. Managers frequently visit postharvest operations in other companies to learn information that they can use to improve their own operations. A practical course for postharvest operators is proposed at a local Institute of Technology.

Fresh Meats New Zealand Ltd, Napier

Date: 2 October 2003
Contact: Peter Jensen
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This company was established in 1989 as the Napier Abattoir and in 2002 changed it's name to Fresh Meats NZ. It provides fresh chilled meat for the local market only.





Fresh Meats employs about 45 staff with a throughput of 1000 units a day. 50% of the end product is carcasses with the other 50% being cut meats. The company's operations are summarised in the following diagram:

The practices of Fresh Meats NZ are governed by the Animal Products Act of NZ. This act requires meat to be chilled to a maximum of 7°C within 24 hours of slaughtering. The company has in place a post-slaughter management system that checks the temperature of carcasses daily (using temperature probes). It also checks the temperature of outward goods daily. Refrigeration systems are electronically controlled and monitored daily. The company uses a refrigerated truck for transporting product to customers. Customers may also collect product but currently there is no requirement for customers to use refrigerated trucks (once the product leaves Fresh Meats NZ it falls under the jurisdiction of the New Zealand Health Department).

External auditing of Fresh Meats NZ Ltd is carried out by MAF.

