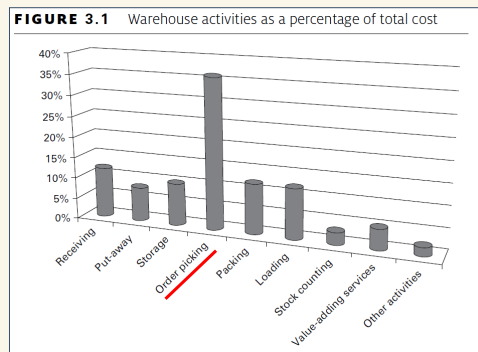# Chapter 3 Receiving and Put-away

- 倉儲的作業流程從receiving and put-away開始
- 簡化流程可提高效率與降低成本，也能使新科技發揮最大效益
- **Order-Picking**是倉儲成本最高的一項

FIGURE 3.1　Warehouse activities as a percentage of total cost

1

Receiving

- A crucial process in the warehouse.

- Supplier compliance: correct product in the right quantity, in the right condition at the right time. 供應商配合

- Once goods have arrived, it's too late to rectify most issues.
  規格錯誤、品質不佳、或數量不符
  人手與設備不足、作業程序有漏洞、人員訓練不足

- Many steps need to be taken before receiving.

  https://www.youtube.com/watch?v=lrv6E
  YeaRGE

2

量販店或便利商店的進貨觀點

- 製造商跳過DC，直接運送至店面，會造成運輸成本大增
- 連鎖店直接從製造商進貨，會造成進貨作業的繁複
- 零售商應有自營的DC或與專業物流合作，要求各製造商運送至DC，再合併配送至店面，以減少進貨作業
- 日常用品與生鮮食品種類多，商品特性差異大，通常由不同的DC或中盤商進貨
- 製造商可能因客戶眾多，堅持自營物流車隊直接配送
- 進貨量大的商品，也可由製造商直接進貨

3

Pre-receipt　　進貨前準備工作

- Buyers may not have knowledge of the goods-receiving operation.
- Must ensure products ordered are compatible with the storage facility.
  確保進貨包裝符合倉儲需求

- ✓ size and type of cartons.
- ✓ type of transit packaging – cardboard, plastic, totes, metal stillages, roll cages, pallets.
- ✓ palletized or non-palletized delivery of product.
- ✓ size (length, width and height) and type of pallets, e.g. euro pallet, four-way entry.

- ✓ specific labelling such as product description, barcode and quantities.
- ✓ position of label on carton and pallet.
- ✓ carton quantities (inner and outer carton quantities).
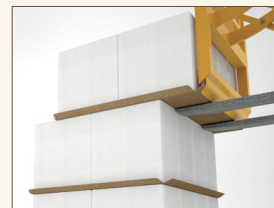- ✓ mode of transport, delivery quantity and frequency of delivery.

4

Pallet

- The transfer of much production offshore has resulted in a significant increase in container traffic. The decision here is whether to loose load or palletize the cargo.

- 木製棧板 (Wooden Pallet)
  重量重、不易清潔、滋生細菌、
  可重複使用

- 塑膠棧板(Plastic Pallet)
  適用於食品、易清潔、壽命長、可重複使用

- slip sheets
  不占空間、重量輕、在貨櫃內可堆疊
  需另外購買專用堆高機
  https://www.youtube.com/watch?v=ZMVTDjsPzxE

5

Benefits of Palletizing

- protection from loss or damage during handling and transportation

- reduction in the number of people required to load and unload containers 減少搬運人力

- The process of loading and unloading is speeded up 加速搬運

- space required at the loading and despatch bays is reduced.

- reduce injury to staff.

6

Pallet Dimensions (ISO)

Dimensions in mm (W × L)	Dimensions in inches (W × L)	Country of use
1219 × 1016	48.00 × 40.00	North America
1000 × 1200	39.37 × 47.24	UK and Asia; pallet commonly referred to as a UK or industrial pallet
1165 × 1165	44.88 × 44.88	Australia
1067 × 1067	42.00 × 42.00	Most countries
1100 × 1100	43.30 × 43.30	Asia
800 × 1200	31.50 × 47.24	Europe; pallet commonly known as a euro pallet

- The size of pallet determines the rack configuration

7

Pack Quantities 紙箱包裝

- Products delivered in outer cartons need to be labelled in such a way that they can be easily identified.

- pack quantities supplied, pack quantities stored, pack quantities sold. 供應商包裝、儲存包裝、販賣包裝

- Pack quantities depend on the value, weight and volume of the product.

- Cartons should not weigh in excess of 20 Kg (44 lbs) from a health and safety point of view. 重量限制

- There needs to be consistency by product line to ensure accuracy during stock counts and reduce picking errors. 10 or 12

8

Preparation

Advanced Shipping Notice (ASN) 預先出貨通知

❖ 包含出貨與預計到達時間、車輛資訊、貨品資訊

❖ 要求供應商事先預約時間並提供ASN，以預先準備進貨碼頭、人員、設備、儲位，減少擁擠與進貨等待時間。

Advance Shipping Notice

To:	Ship To:	Ship From:	From:
Demo Buyer Inc 1212 Las Vegas Boulevard Las Vegas, Nevada 89109 tel: 808 555 5555 fax: 877 555 1002 purchasing@demobuyer.com	Demo Buyer Inc - LA Warehouse 1111 S. Figueroa Street Los Angeles, California 90015 United States tel: 1 800 555 5555	Demo Supplier Inc. - San Pedro 555 Channel Street San Pedro, California 90731 United States tel: 310 121 1234	Demo Supplier Inc. 555 Channel Street San Pedro, California 90731 tel: 310 555 1002 fax: 310 121 1237 fulfill@demosupplier.com

Buyer Name: Chris Adams
Buyer PO: 111305CAA
System PO#: 66
Project:
Required Delivery Date: 02/14/2008
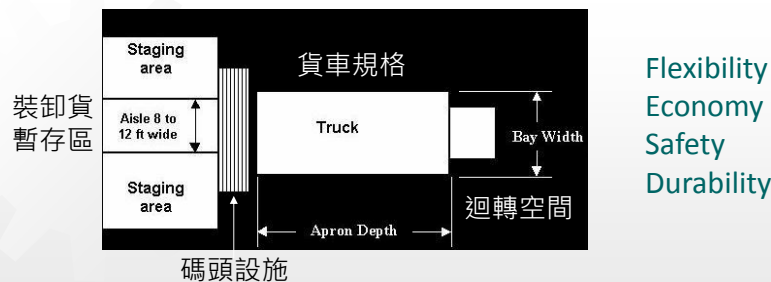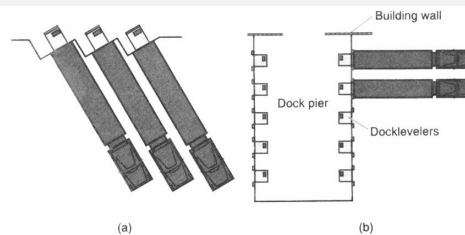Product for Resale: Yes

Page: 1 of 2
Shipper: QUEBECOR - FedEx Freight West
Ship Date: 07/16/2007
Custom Shipper:
Supplier Name: Kelly Smith

https://www.youtube.com/watch?v=_8jGK5Eklsk

Line	Buyer Part#	Product Description	Service	Supplier Part#	Manuf. Part#	QTY ordered	QTY shipping	Date available	Dimensions	Weight	BULK	Unit Price	Tax and Tariffs	Ext. price
1	111305CAA	deluxe thermo dispenser with gauge glass, 2.5 liter, 6 pack	No			10	10	11/23/2006	20 Inch x 10 Inch x 15 Inch	15 Pound	No	$799.00 per	$0.00	$15,980.00

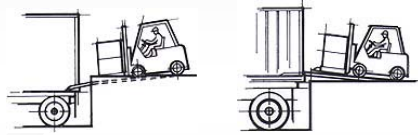| Commodity		Class		Special Instructions	
		250			

Hazardous	Hazardous Code	UNNO	Schedule H Code	Freight Terms	Fvente Service	Transportation Service Level	Type of shipment	Domestic/Intl/Air	Equipment Grade
No				Domestic - FOB Origin	Inbound Freight	UPS Ground	LTL (less than truck load)	Door to Door	No Special Reqs.

9

Loading Dock Design

Flexibility
Economy
Safety
Durability

裝卸貨暫存區

Staging area
Aisle 8 to 12 ft wide
Staging area

貨車規格
Truck
Bay Width

迴轉空間
Apron Depth

碼頭設施

10

Loading Dock Operation

dock leveler(月台架橋、校平器) 解決月台與貨艙上下落差的機械設備，可讓搬運車輛順利進出貨艙

11

Unloading and Offloading

- ✤ Need appropriate labour and equipment.
- ✤ Unloading times will vary depending on the equipment used
  包裝與設備影響卸貨時間
- ✤ powered pallet truck, hand pallet truck , pallet jack….

12

Automated Unloading

The best way to unload a container
https://www.youtube.com/watch?v=Mc-lC1yclgU

13

In-handling   理貨作業

* One of the main challenges for a warehouse manager is to match labour hours with work content.
* Labour can be between 48 and 60 per cent of the total warehouse cost, depending on the amount of automation utilized
* In-handling makes up approximately 20 per cent of the total direct labour cost.
* 生鮮與低溫食品的時間控制

14

Recording and Quality Control

- Recording入庫紀錄

Ex. product code, description, quantity on arrival, batch or lot numbers and serial numbers.

- Quality control

More checking: new suppliers, high-value items, food, hazardous goods, temperature-sensitive product and pharmaceuticals. 需特別檢驗

Most WMSs are able to block access to products on the system, making them unavailable for picking until cleared for sale.

15

Consumer's Risk vs. Producer's Risk

假設某產品的不良率不得超過1%

如果進貨數量不多而且人手充足 ⇒ **全部檢驗**

如果無法全部檢驗 ⇒ **抽驗多少個？通過的標準是甚麼？**

1. 設進貨10000個，其中 不合格品有20個
抽驗50個，發現5個不良品，整批拒收 ⇒ 生產者(賣方)風險

2. 設進貨3000個，其中 不合格品有100個
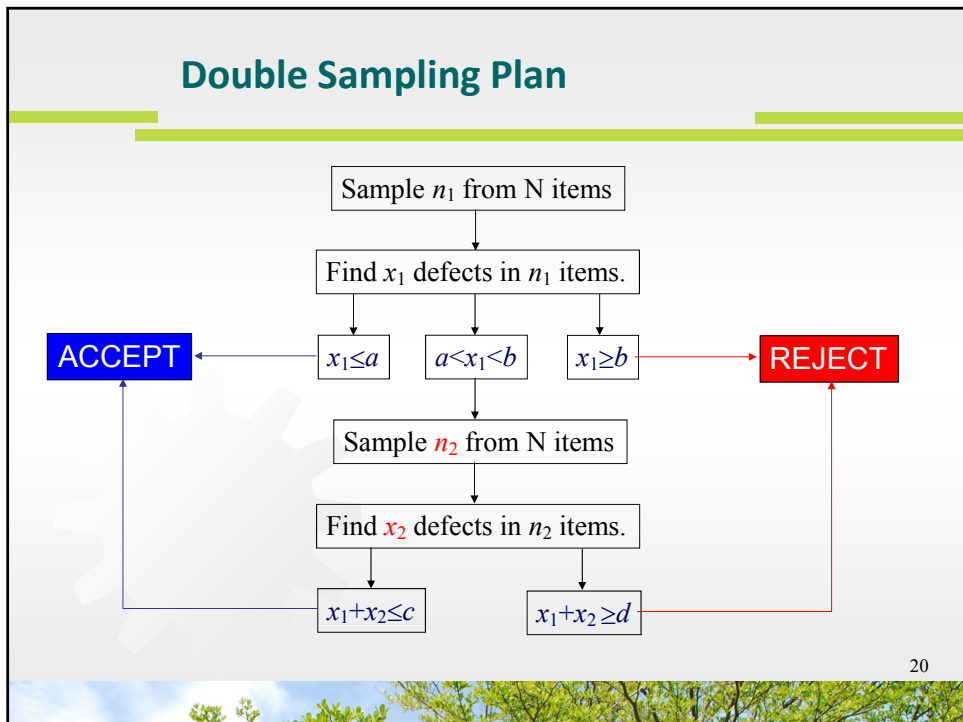抽驗60個，未發現不良品，整批允收 ⇒ 消費者(買方)風險

16

Sampling Inspection

1. 確定品質檢驗標準–良品與不良品如何區分
2. 依據貨品決定允收水準高低–Acceptance Quality Level (AQL)
3. 根據時間或成本決定檢驗程度–減量、**正常**、增量檢驗
4. 決定檢驗水準(I, II, III) –控制檢驗誤判的機率，保障使用者

5. 查表找出檢驗的代碼 (code letter)–因檢驗水準不同而異
6. 決定抽樣計劃–導出抽樣數量與允收標準

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Sample size	減量檢驗 (reduced)				正常檢驗 (normal)		
	S-1	S-2	S-3	S-4	I	II	III
2-8	A	A	A	A	A	A	B
9-15	A	A	A	A	A	B	C
16-25	A	A	B	B	B	C	D
26-50	A	B	B	C	C	D	E
51-90	B	B	C	C	C	E	F
91-150	B	B	C	D	D	F	G
151-280	B	C	D	E	E	G	H
281-500	B	C	D	E	F	H	J
501-1200	C	C	E	F	G	J	K
1201-3200	C	D	E	G	H	K	L
3201-10000	C	D	F	G	J	L	M
10001-35000	C	D	F	H	K	M	N
35001-150000	D	E	G	J	L	N	P
150001-500000	D	E	G	J	M	P	Q
500001以上	D	E	H	K	N	Q	R

Single Sampling Plan (normal inspection) 單次正常檢驗

Sample size code letter		Acceptable quality levels (normal in														
		0.010	0.015	0.025	0.040	0.065	0.10	0.15	0.25	0.40	0.65	1.0	1.5	2.5	4.0	6.5
		Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re
A	2															0 1
B	3														0 1	
C	5													0 1		
D	8												0 1			1 2
E	13											0 1			1 2	2 3
F	20										0 1			1 2	2 3	3 4
G	32									0 1			1 2	2 3	3 4	5 6
H	50								0 1			1 2	2 3	3 4	5 6	7 8
J	80							0 1			1 2	2 3	3 4	5 6	7 8	10 11
K	125						0 1			1 2	2 3	3 4	5 6	7 8	10 11	14 15
L	200					0 1			1 2	2 3	3 4	5 6	7 8	10 11	14 15	21 22
M	315				0 1			1 2	2 3	3 4	5 6	7 8	10 11	14 15	21 22	
N	500			0 1			1 2	2 3	3 4	5 6	7 8	10 11	14 15	21 22		
P	800		0 1			1 2	2 3	3 4	5 6	7 8	10 11	14 15	21 22			
Q	1250	0 1			1 2	2 3	3 4	5 6	7 8	10 11	14 15	21 22				

Double Sampling Plan

Sample n_1 from N items

Find x_1 defects in n_1 items.

ACCEPT ← $x_1 \leq a$ | $a < x_1 < b$ | $x_1 \geq b$ → REJECT

Sample n_2 from N items

Find x_2 defects in n_2 items.

$x_1 + x_2 \leq c$ → ACCEPT

$x_1 + x_2 \geq d$ → REJECT

20

商品有效期限允收標準

Expiration date vs. Shelf life

0. 保存期限從製造日期起算，有效期限從進貨日期起算。

1. Domestic: 國內製造商品保存期限在一年以上時，允收標準通常為有效期限至少達保存期限2/3以上。

2. Import: 進口商品之允收標準較寬，例如有效期限至少達保存期限1/2以上。

3. 保存期限為數日或極短之商品，通常以製造日期D日起算，例如進貨日期不得超過D+2日

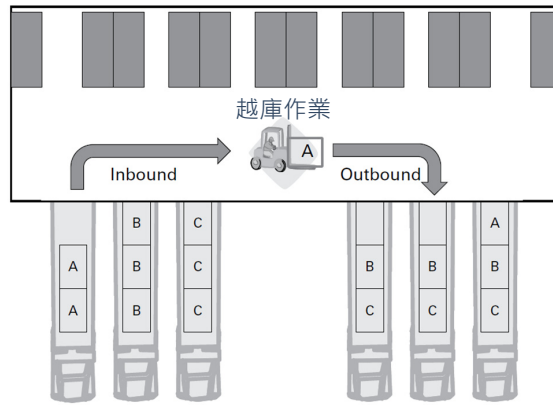4. 若進口商品僅標示有效日期，則允收標準可定為距有效期限尚有6個月以上。

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商品允收標準範例

保存期限	Domestic		Import	
	允收標準	DC庫存出貨期限	允收標準	DC庫存出貨期限
3年(含)以上	25個月	進貨後1個月內	21個月	進貨後3個月內
2年	17個月	1個月	14個月	2個月
18個月	13個月	1個月	10個月	1個月
1年	9個月	1個月	6個月	1個月
9個月	7個月	1個月	4.5個月	0.5個月
8個月	6個月	20天	4個月	0.5個月
6個月	160天	20天	85天	15天
4個月	4個月	10天	55天	10天
3個月	3個月	10天	45天	5天
2個月	50天	5天	25天	5天
1個月	35天	5天	-	-
16天≦T＜30天	25天	2天	-	-
10天≦T＜16天	D+4天	1天	-	-
6天≦T＜10天	D+3天	1天	-	-
2.5天≦T＜6天	D+1天	1天	-	-
鮮食商品＜2.5天	當天	當天	-	-

22

Cross Docking

- Receive products from multiple suppliers and sort and consolidate them for onward shipment to different stores

越庫作業

Inbound   A   Outbound

B C
A B C
A B C

B B A
C C B
C C

23

Cross Docking

Process	Goal
products are moved directly from goods-in to the despatch bays.	increase throughput rates and reduce the amount of stock held.
Application perishable goods, Just-in-time systems.	**Support** Ex. clear labelling, advance notice of arrival, on-time delivery… Sufficient space is key to moving products quickly and safely.

Cross-Docking: Receiving Dock Direct to Shipping Dock
https://www.youtube.com/watch?v=OS5CrureJoE

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Put-away

In order to work effectively, a great deal of information needs to be programmed into WMS : 入庫資料

- size, weight and height of palletized goods
- results of an ABC analysis or slotting, where fast-moving goods are placed closest to the despatch area
- current order data
- family product groups
- actual sales combinations
- current status of pick face for each product
- size of pallet locations
- weight capacity of racking

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Storage Location Assignment   儲位指派

- fixed locations ：designate a specific location for a particular product.
  1. enable the picker to memorize the actual location.
  2. speed up the picking process.
  3. reduce storage utilization.

- random location: the pallet is placed in the most efficient slot available.

- fastest-moving items: should be placed in the middle row of shelving

- Slower-moving items: should be placed in the lowest and highest shelves.

- Items should be stored in groups by similarity. 關聯性

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Storage Location Assignment 儲位指派

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Receiving Checklist

- 貨物是否準時送達？ 文件是否齊全？
- 規格與數量是否正確？ 防止誤收、短缺、偷竊
- 品質與有效期限是否符合規範？ 防止誤收
- 送貨文件是否正確處理？
- 拒收貨物是否正確處理？
- 車輛離開時是否經過檢查？
- 貨物是否正確入庫？ 防止誤置或偷竊

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