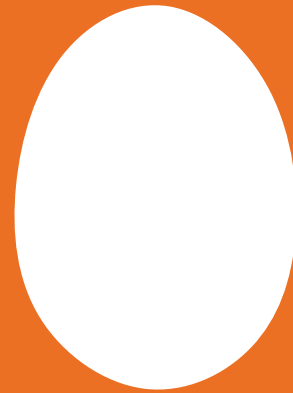# PAPER PACKAGING FOR EGGS

KRUTTIKA GULHANE | 10603001 | PROJECT GUIDE - PROF. V P BAPAT

Structure of the presentation
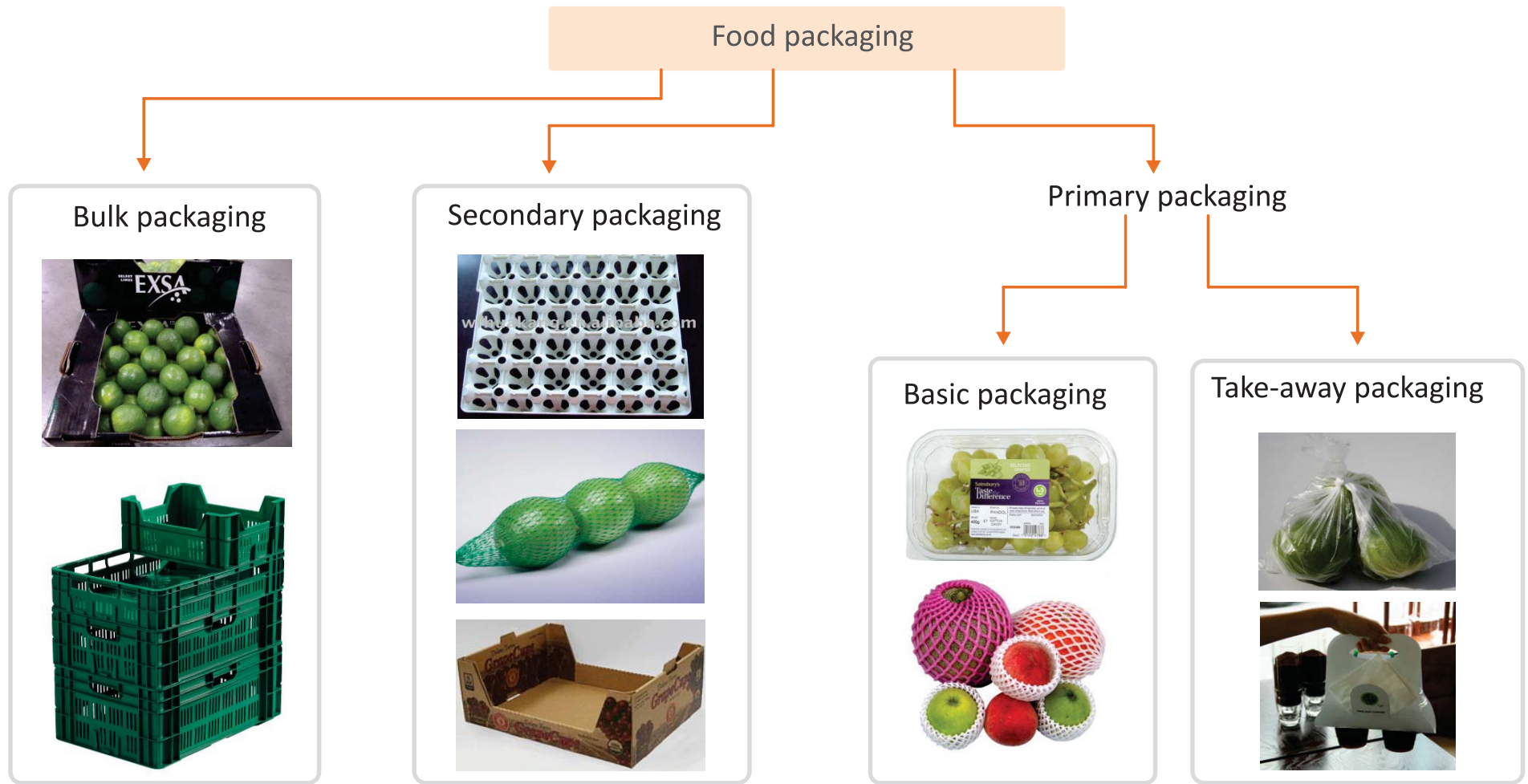
Introduction

Data collection

Ideation and conceptualization
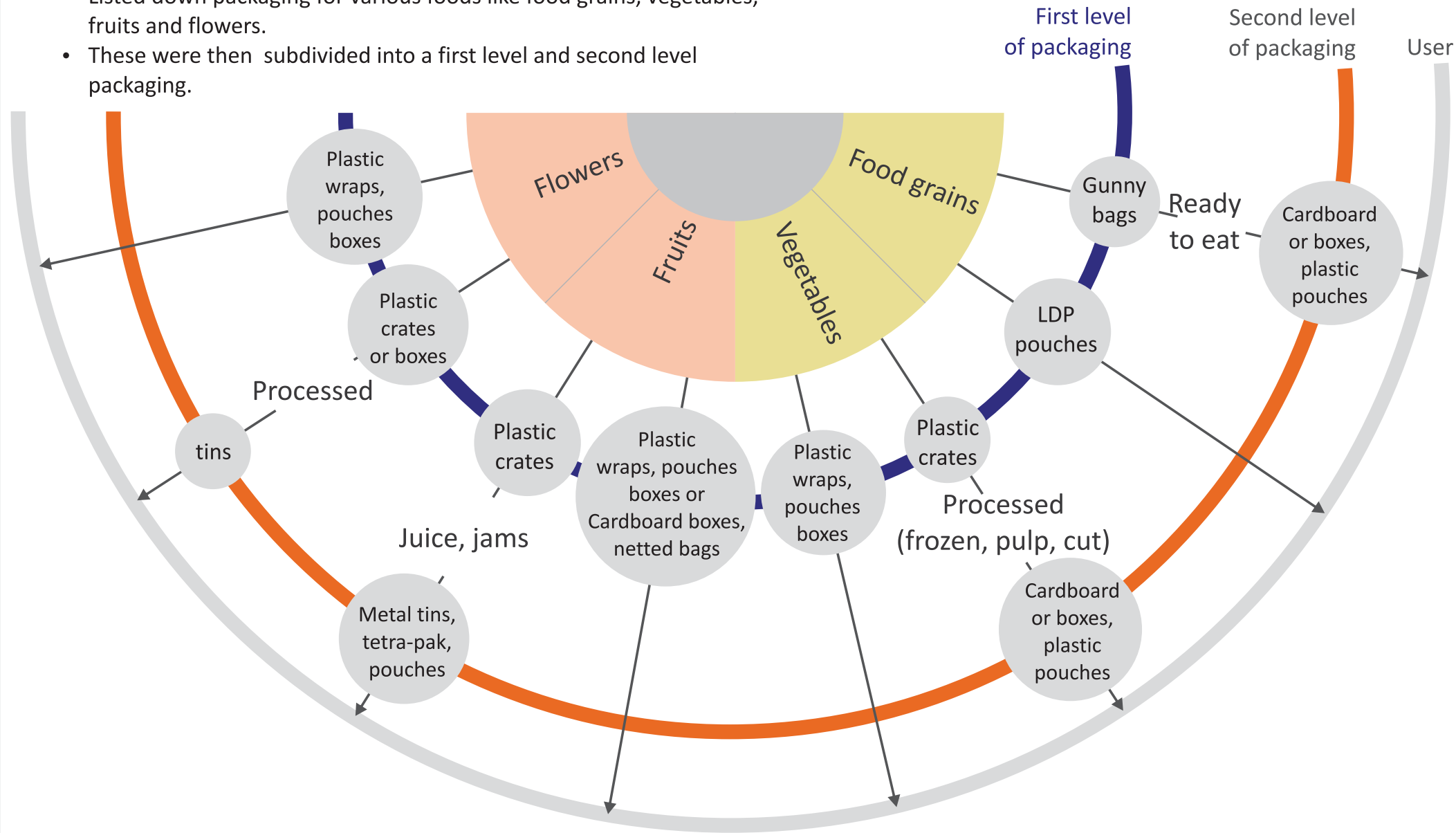
Final Design

Types of Food packaging

Food packaging

Bulk packaging

Tertiary packaging is used for bulk handling, warehouse storage and transport shipping.

Secondary packaging

Secondary packaging is outside the primary packaging, perhaps used to group primary packages together.

Primary packaging

Basic packaging

Take-away packaging

Primary packaging is the material that first envelops the product and holds it. This usually is the smallest unit of distribution or use and is the package which is in direct contact with the contents.
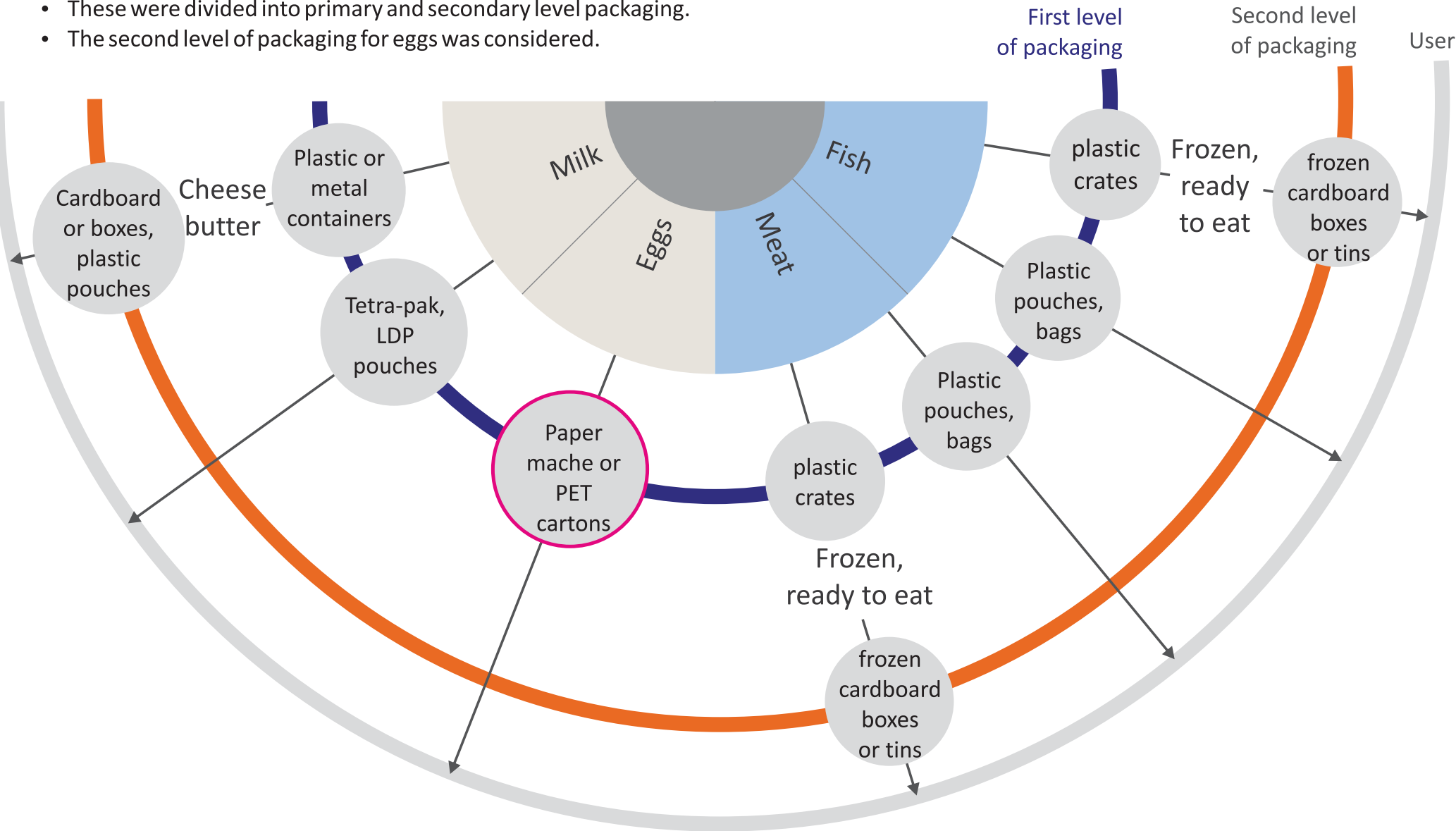
Taxonomy of Food packaging

- Listed down packaging for various foods like food grains, vegetables, fruits and flowers.
- These were then subdivided into a first level and second level packaging.

First level of packaging

Second level of packaging

User

Flowers

Food grains

Fruits

Vegetables

Plastic wraps, pouches boxes

Gunny bags

Ready to eat

Cardboard or boxes, plastic pouches

Plastic crates or boxes

LDP pouches

Processed

Plastic crates

Plastic wraps, pouches boxes or Cardboard boxes, netted bags

Plastic wraps, pouches boxes

Plastic crates

tins

Juice, jams

Processed (frozen, pulp, cut)

Metal tins, tetra-pak, pouches

Cardboard or boxes, plastic pouches

Taxonomy of Food packaging

- Packaging for milk, eggs , meat and fish were also listed down.
- These were divided into primary and secondary level packaging.
- The second level of packaging for eggs was considered.

First level
of packaging

Second level
of packaging

User

Milk

Fish

Eggs

Meat

Cheese butter

Plastic or metal containers

Cardboard or boxes, plastic pouches

Tetra-pak, LDP pouches

Paper mache or PET cartons

plastic crates

Plastic pouches, bags

plastic crates

Plastic pouches, bags

Frozen, ready to eat

frozen cardboard boxes or tins

Frozen, ready to eat

frozen cardboard boxes or tins

Data collection

Distribution of eggs

Collection of eggs

Sent for processing

Sent for Packaging

Pre-packed eggs
normally packed in cartons(paper-mache, plastic)

Sold at supermarkets or bigger stores

User

Eggs packaged in
plastic trays stacked one on top of the other.

Sold at smaller shops

User

Delivery of the eggs from a small shop

- The entire process from the wholesale of the eggs to the consumer.
- The process includes the transport of eggs from whole-seller to smaller shops and from shops carried to home.

| Eggs packaged normally in plastic trays | Egg trays transported | Sold at smaller shops | Eggs carried from shop to home | Eggs at home |
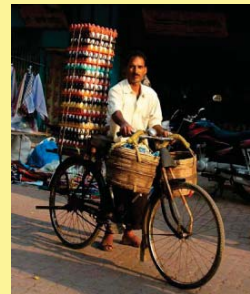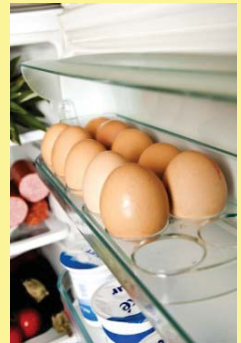
At the small shop

The eggs were packed in polythene bags and paper. If number of eggs was 3 or more polythene bags were used ,otherwise newspaper.

Eggs packaged in a polythene bag

Eggs packed in handkerchief after put in a polythene bag.

Eggs packaged in newspaper

Types of small egg shops

1

2

3

4

5

6

7

8

1 Road-side Egg shop selling other small eatables but not bread, butter milk.
2 Smaller version of type 1 shop, located inside a locality.
3 Shop selling only eggs no other side items.
4 Portable egg shop on bicycle.
5 Chicken butchery selling eggs.
6 Eggs sold on a thela.
7 Eggs sold in a provision store.
8 Wholesale egg store.

The pre-packed egg process

The whole process from the packaging plant to consumers home.

1	>	2	>	3	>	4
At the packaging plant		During transit		At the shops/malls		At home
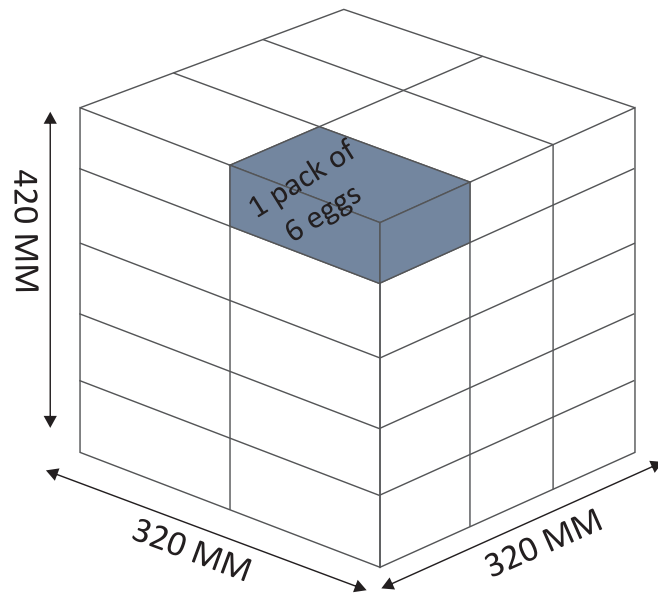
Cartons sized 320 X 320 X 420 MM containing 30 packs for 180 eggs.

The pre-packed egg process

1 Bulk packs loaded into the trucks at the packaging plant and unloaded at the mall/shop.

Egg cartons
(30 egg packs in each box)
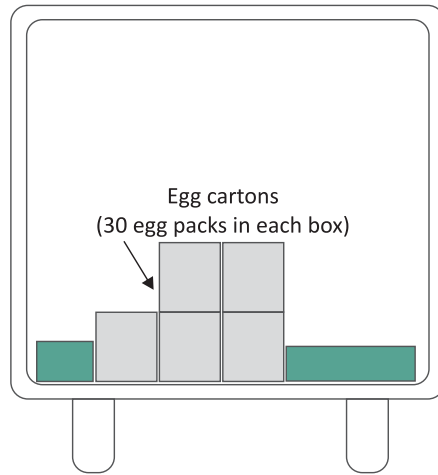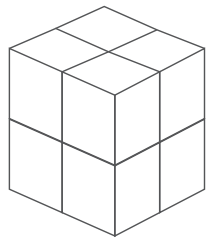
2 The bulk cartons taken inside the mall, opened and 6-egg packs placed on the shelves

The pre-packed egg process

3 Pre-packed egg packs placed on mall shelves or shop counters

630 MM 450 MM 400 MM
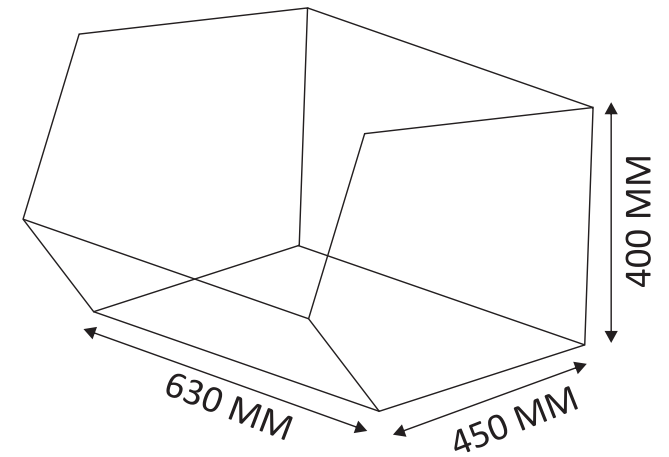
4 The egg packs kept in the shopping trolley then taken to the billing counter for billing and he places the pack in the polythene packet.

The pre-packed egg process

5 The polythene packets/ bags kept on the kitchen floor then the egg pack place on the kitchen platform.

6 Pack opened and the eggs emptied in a strainer to be washed under the tap and then kept in the refrigerator.

Other case-studies

- This is a cake box at *'Bread Talk'* bakery.
- The boxes stacked one into the other when stored at the shop. This box is basically packed in 3 steps.
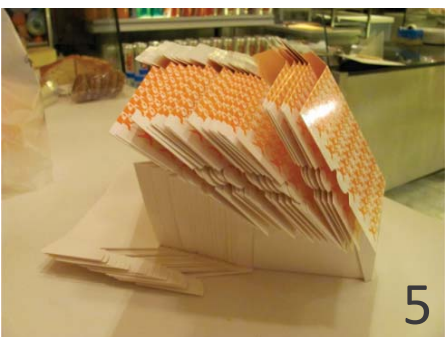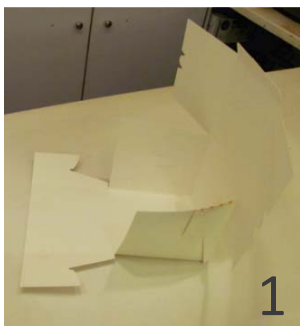
Other case-studies

- This is a glass holder given at *'Mcdonalds'* for take-away drinks. This simple packaging can be used for a single glass or two glasses.
- Here the packaging is also designed in modules to make it easy for manufacturing.
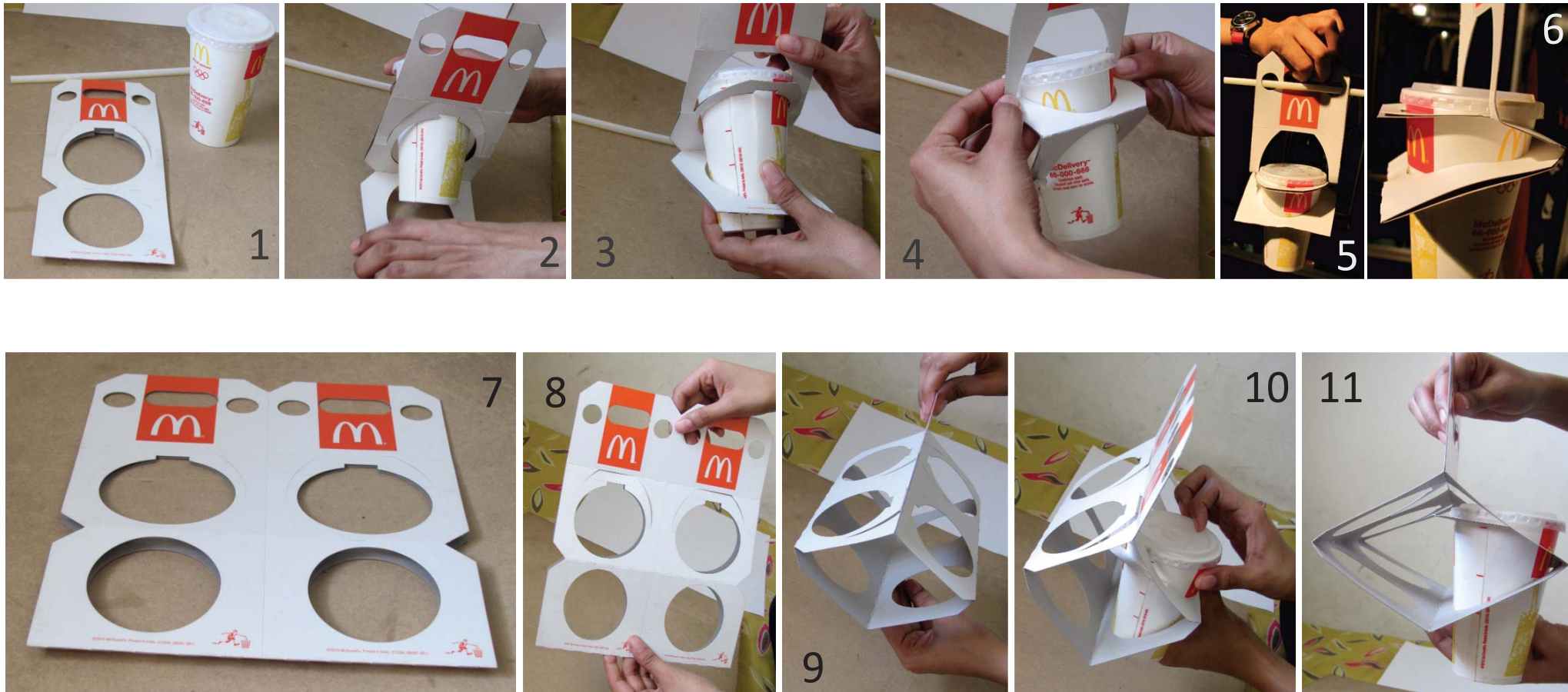
Other case-studies

- This is a holder provided at *'KFC'*. This packaging is designed as a glass base with lock-able top edge.
- Here the packaging is also designed to make it easy for manufacturing.

Other case-studies

- The first group of images show the *'Mcdonalds'* fries pack.
- This pack has the curved pillow pack fold at the bottom making this into a strong package made from a relatively thinner box-board.
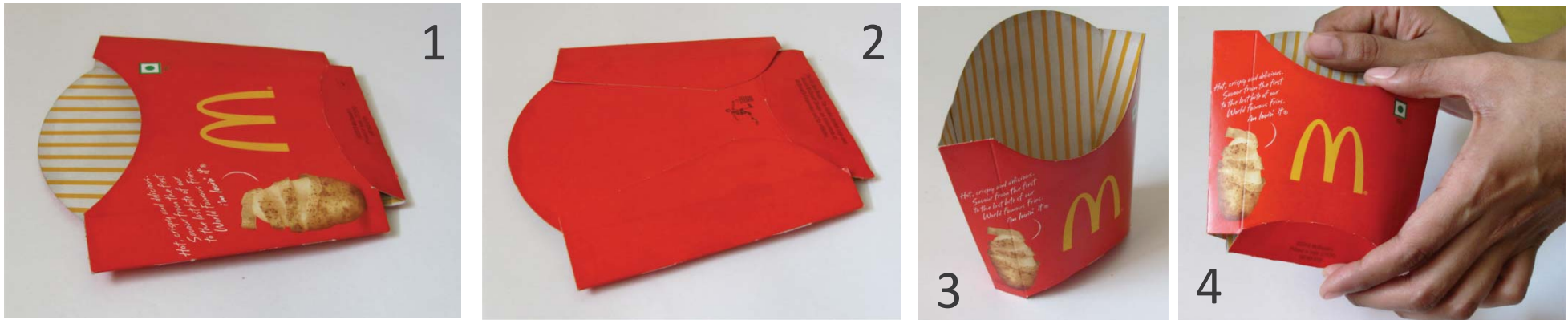
- And the second group of images show a handle for a disposable cup designed in corrugated board.
- Also the pillow pack curved fold on the side adds to the strength of the handle and provides a good grip space.
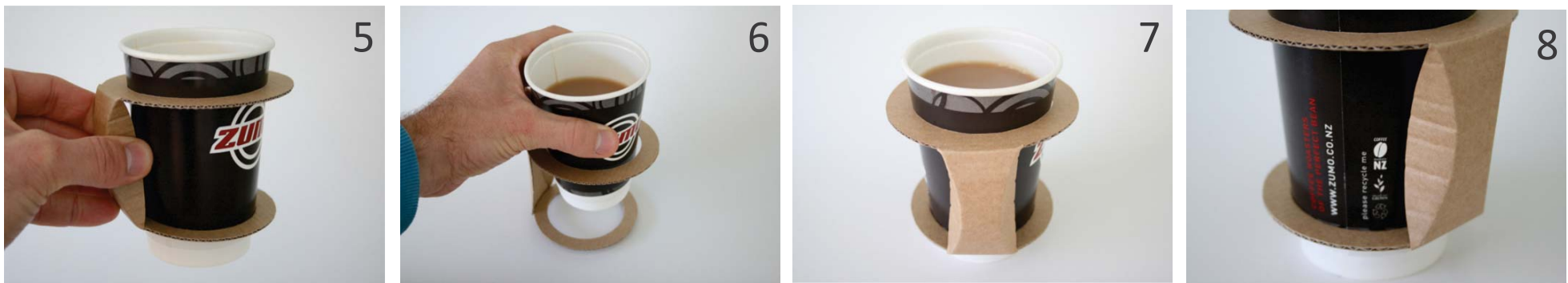
Materials

- Materials like box-board, white-lined chipboard, corrugated sheet, single faced corrugated board could be used to design an effective, economical packaging.
- While selecting the materials the optimum strength of the material should also be considered.
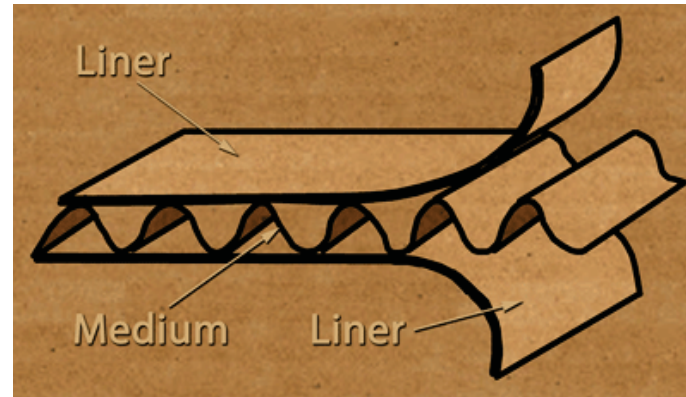
Structure of an egg

- The basic study of the structure of the egg.
- Its strengths and weakness.

Vertical Axis = 5.7cm

Weight = 58gms

Short Axis = 4.2cm

Stronger section of the egg

Weaker section of the egg

Weaker arrangement

stronger arrangement
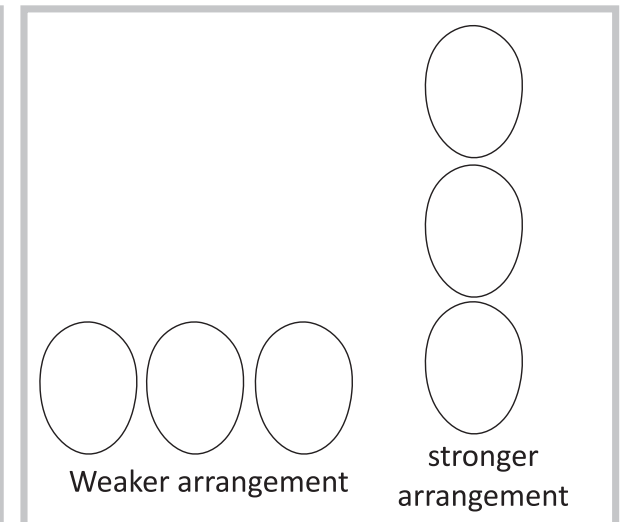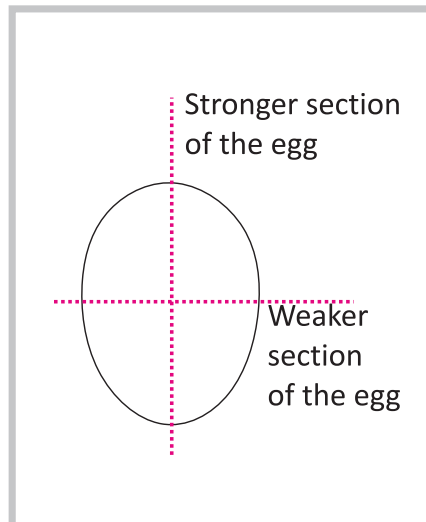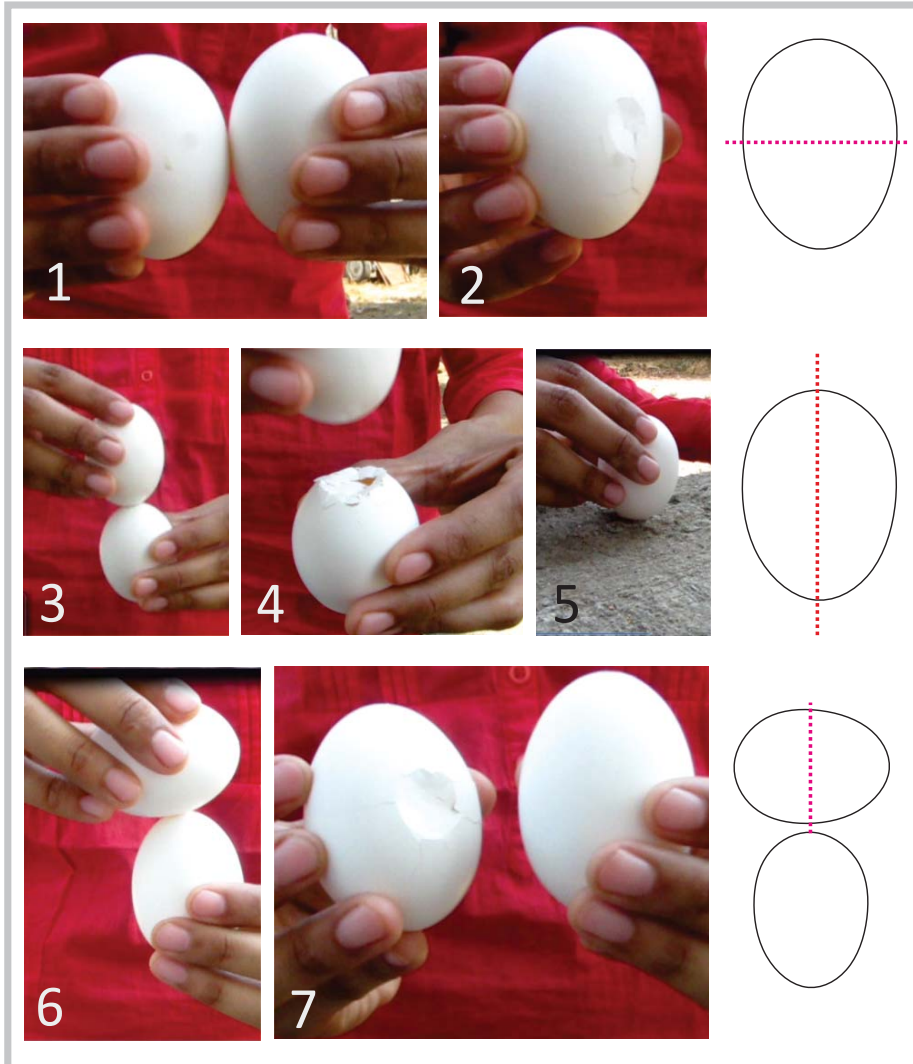
Holding the egg in place

- Egg being nearly ellipsoid form, its hard to hold it in a place.
- Experiments were conducted to find out the best way to do so.

A ring at this level will hold the egg

A ring at this level will hold the egg
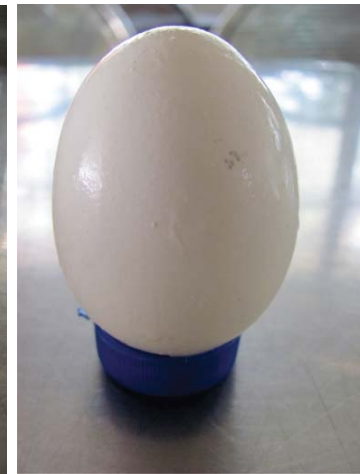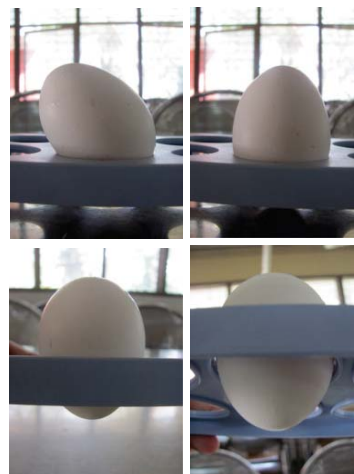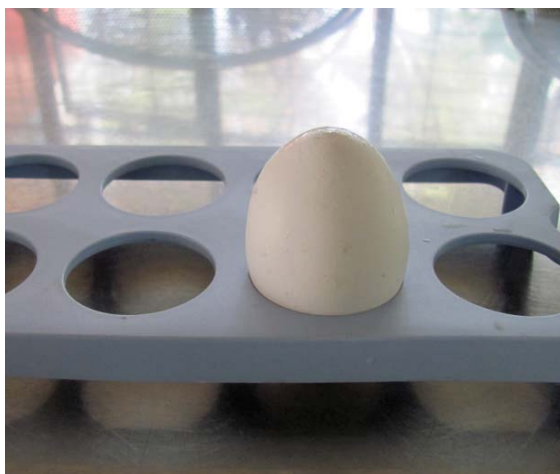
Ideation and conceptualisation

Design Brief

The product

- To design packaging for 6 eggs in paper.
- The package should be easy to transport and easily stack-able.
- The product will be bulk packed in larger cartons at the packaging godowns before being brought to the shops.
- It should be compact enough to fit into small bags (20cm X 25cm) given at all supermarkets.
- It should be possible to place the package on a flat surface.

The user

- The user will be a person who shops at the food-malls for his daily groceries like milk, bread, eggs.
- He is looking for a ready to use hygienic products.
- Cost is not the first thing he notices in the products but the brand, nutritional value and cleanliness.

The market

- Places where these pre-packed eggs would be sold are malls like *Big Bazaar*, *Reliance fresh*, *Reliance delight*, *Spencer's*, etc and other grocery shops which prefer selling pre-packed egg cartons.
- These packs will be stored in shelves at these shops.
- From the shelves people will be picking a pack of their choice and will take it at the billing counter.

Ideation

Ideation was carried out taking into consideration these points -

1. Holding the egg in place

2. Stack-ability of the sheets

3. Avoid breakage of eggs

4. Increase carry-ability

5. Locking of the package

6. Strengthening the paper

Ideation - Holding the egg in place
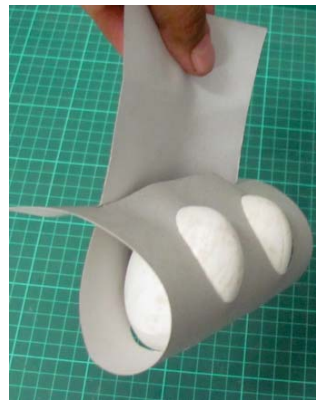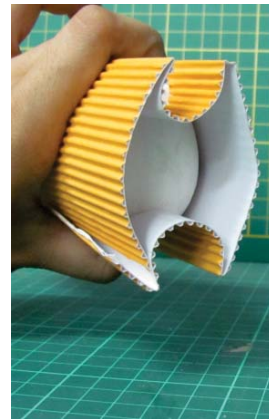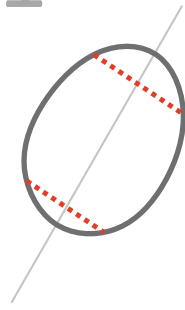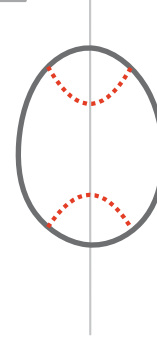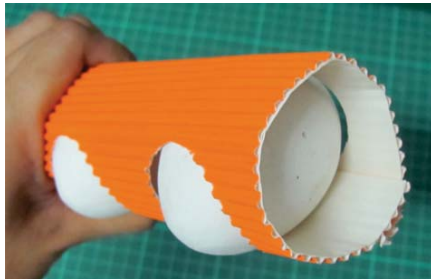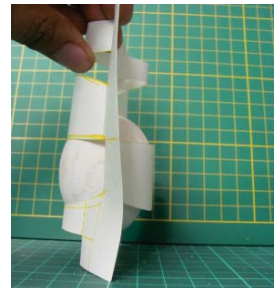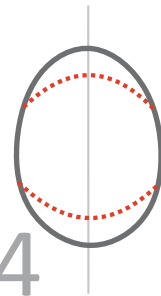
Ideation - Holding the egg in place

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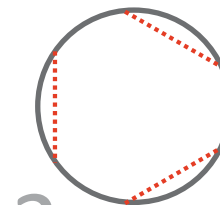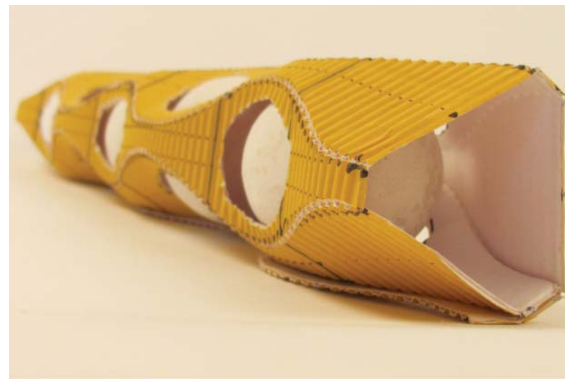
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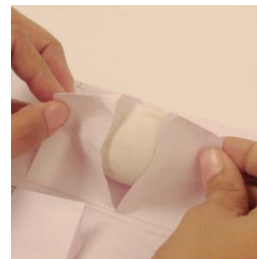
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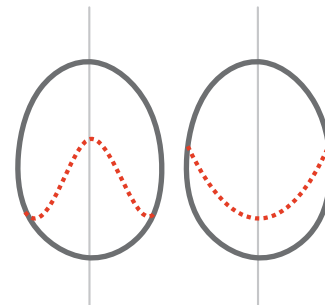
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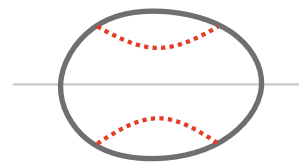
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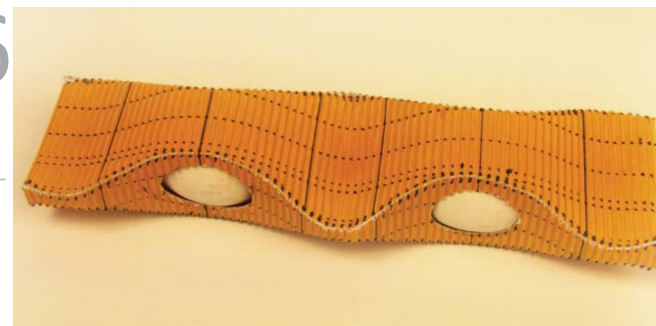
Ideation - Stack-ability of the sheets
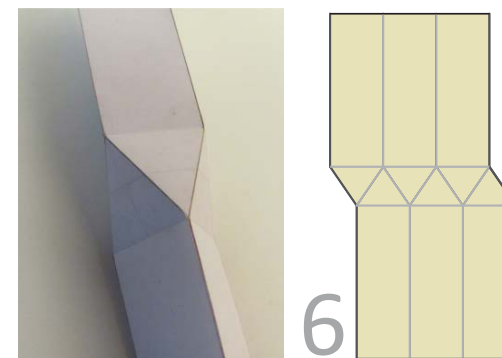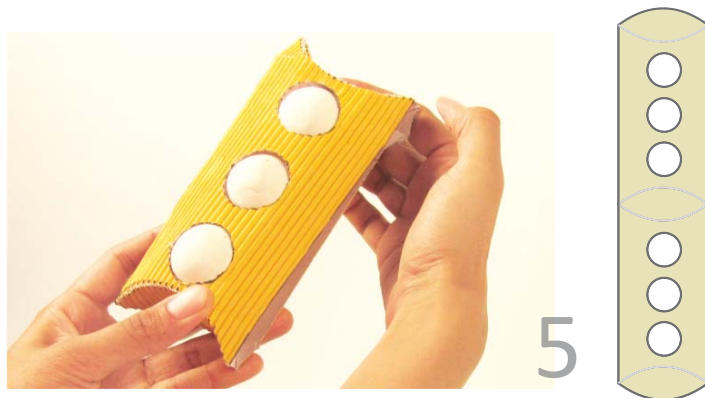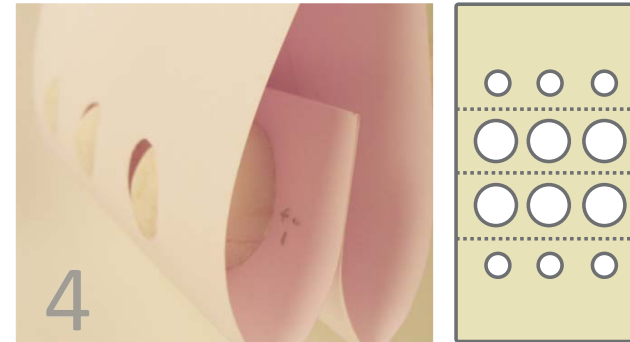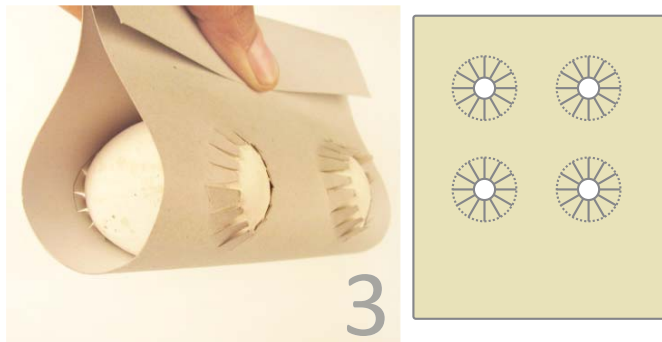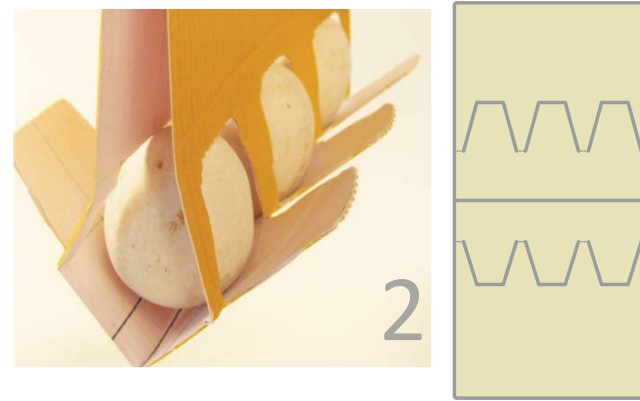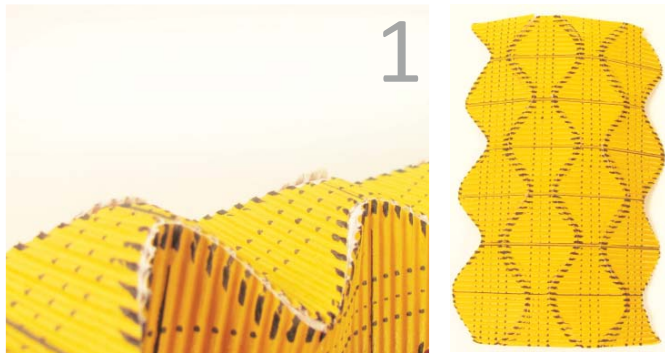
Ideation - Stack-ability of the sheets
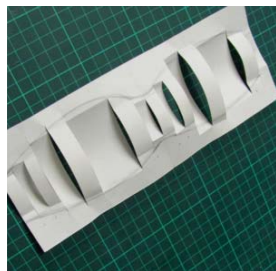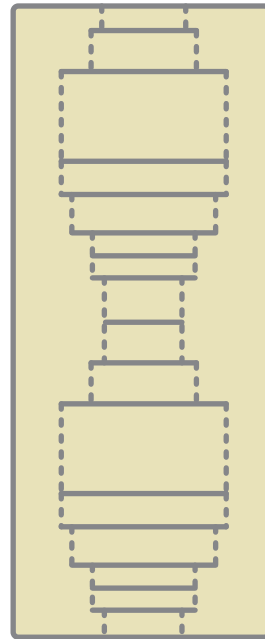
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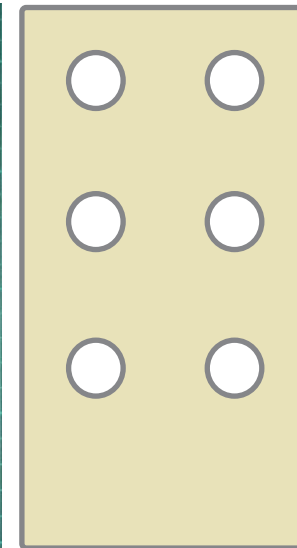
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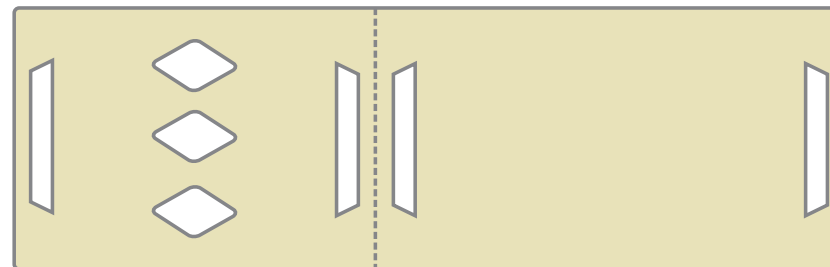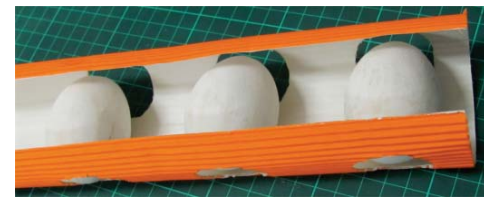
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Ideation - Stack-ability of the sheets
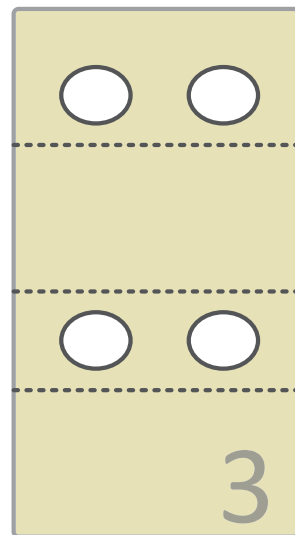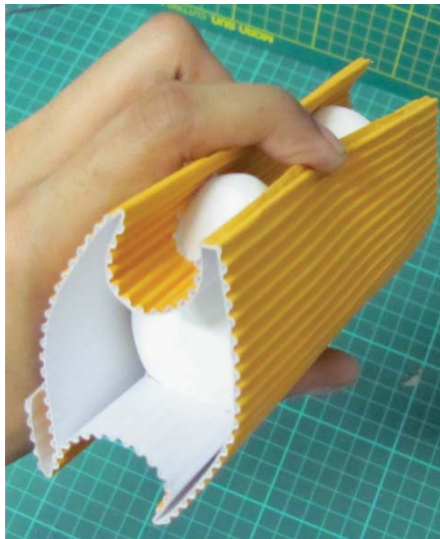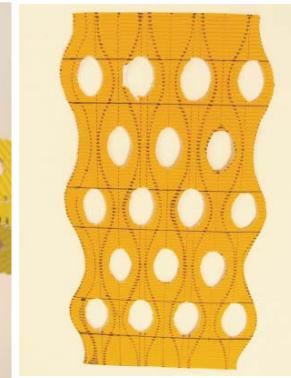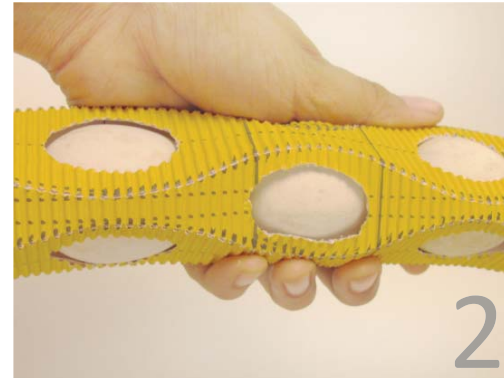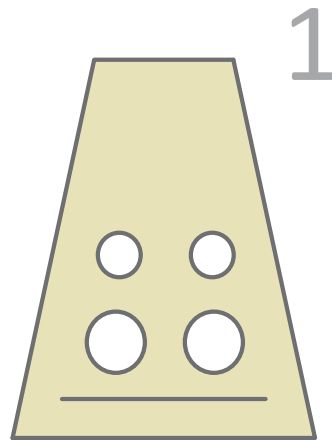
Ideation - Avoid breakage of eggs
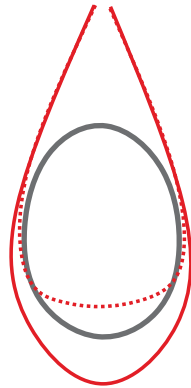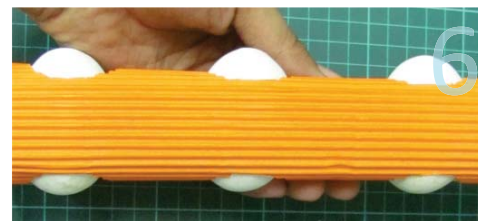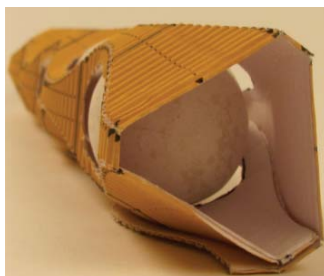
Ideation - Avoid breakage of eggs
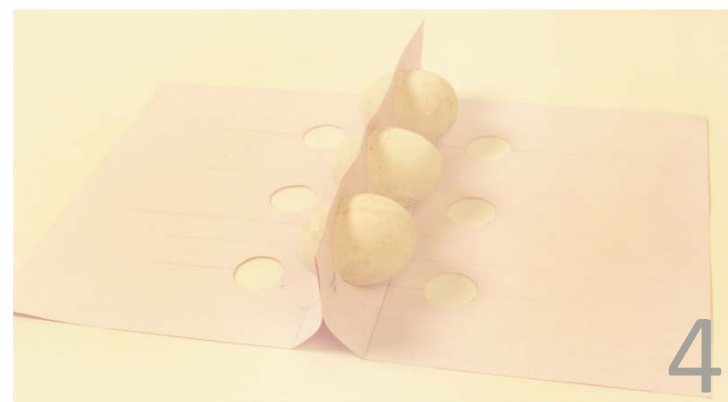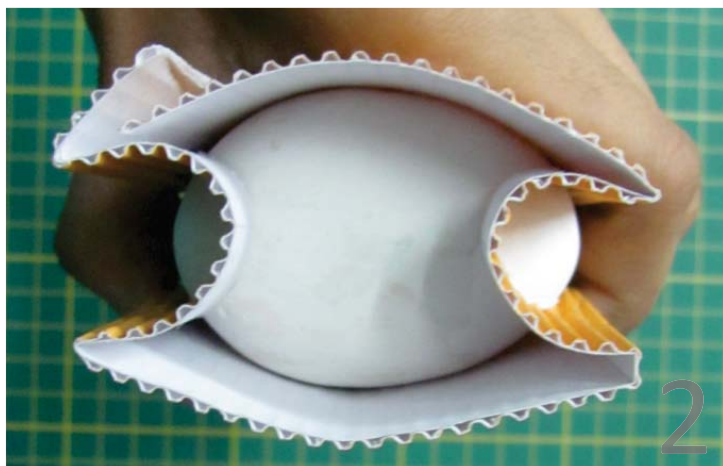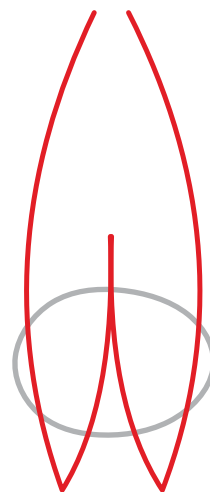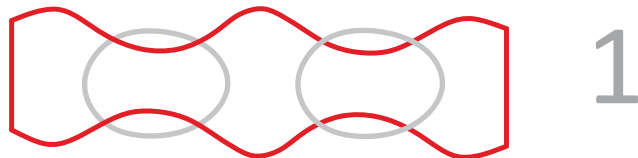
Ideation - Carry ability
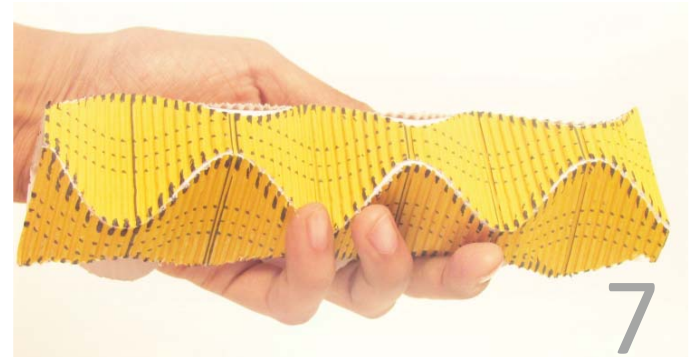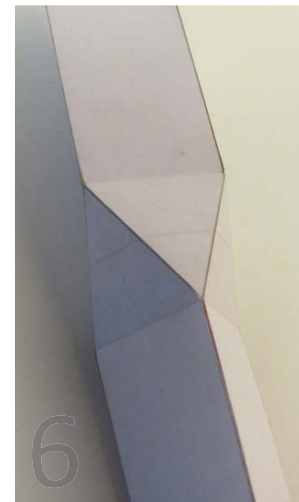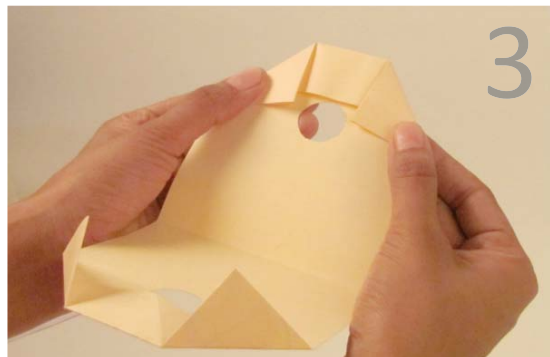
Ideation - Locking the product

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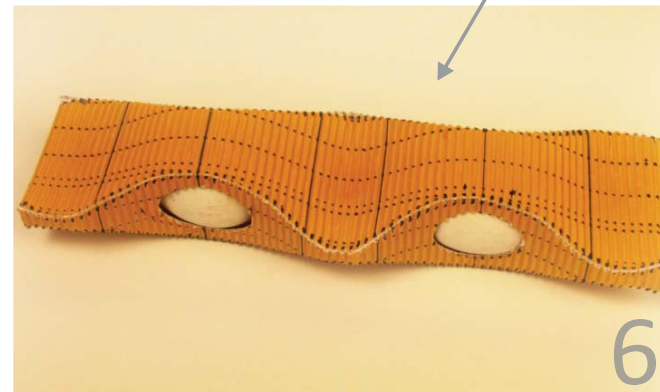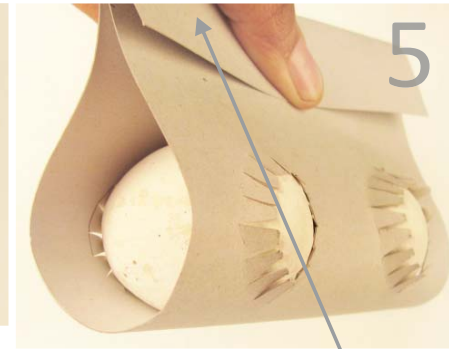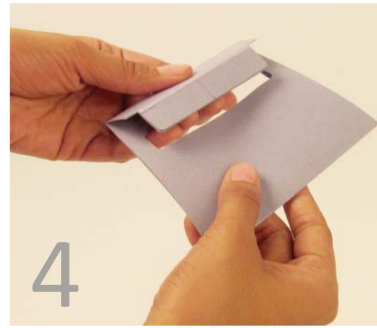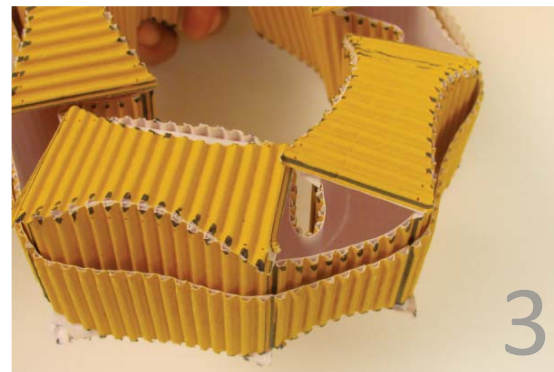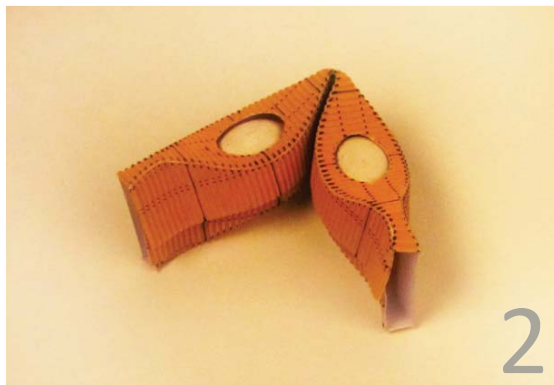
Ideation - Strengthening the paper

Refined Idea 1

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Refined Idea 2

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Refined Idea 3

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Concept 1

Concept 2

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2

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4

5

6
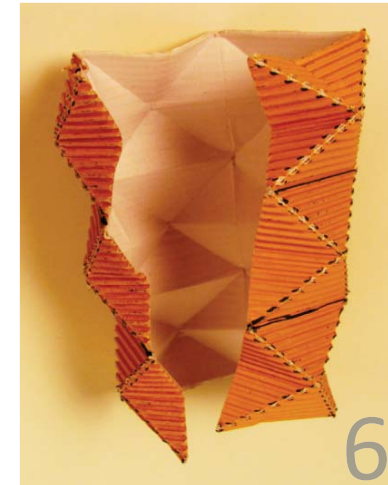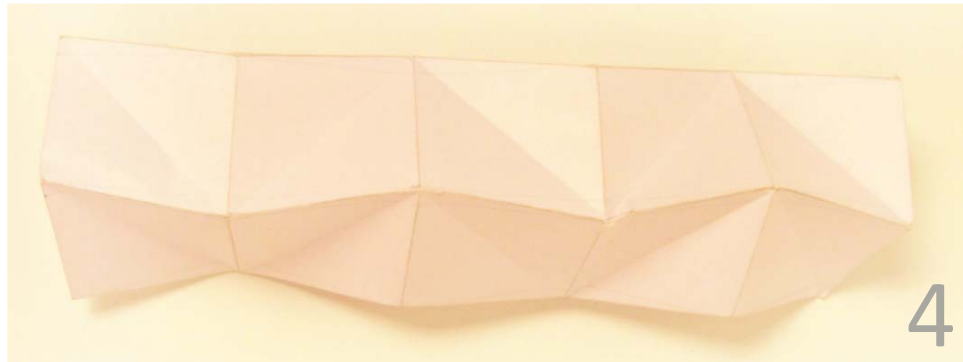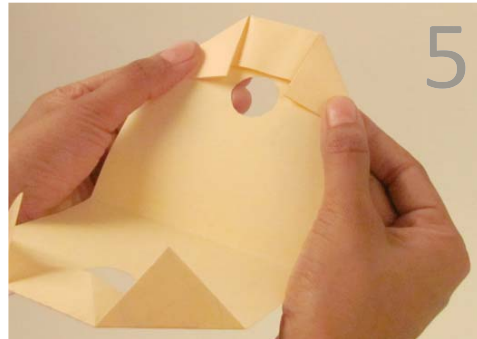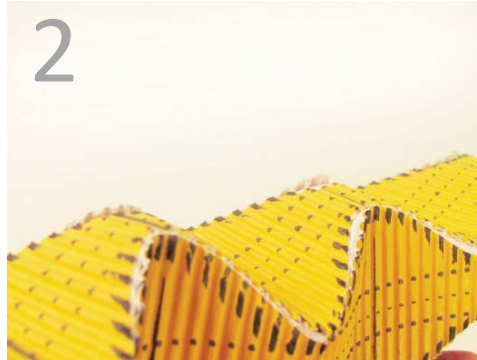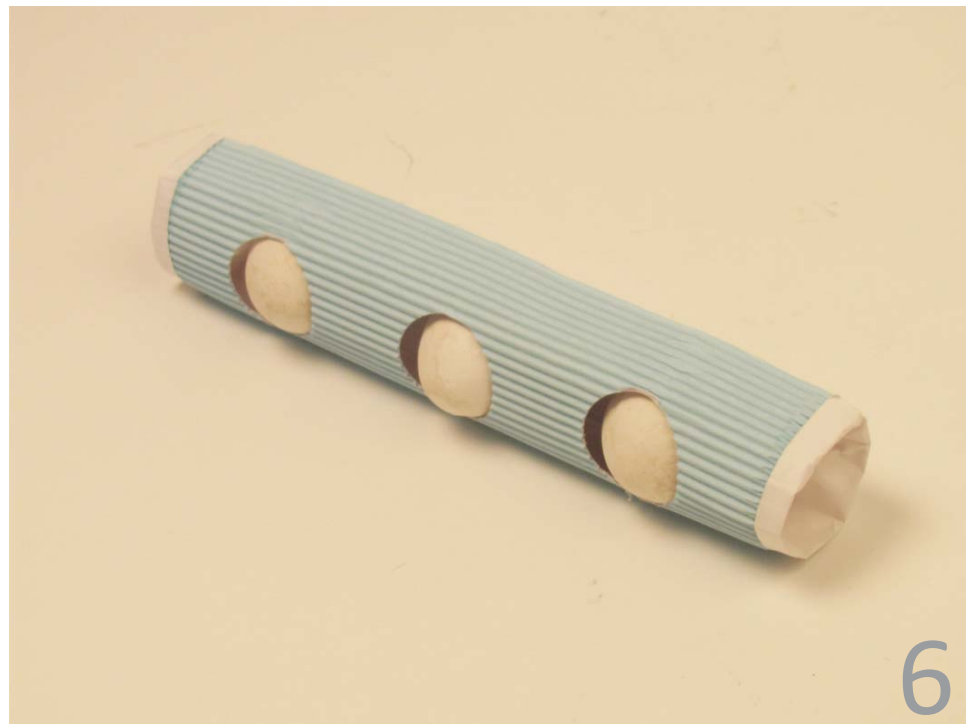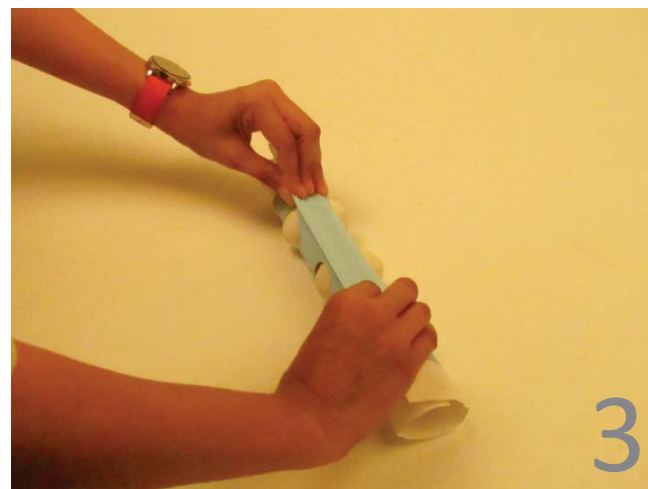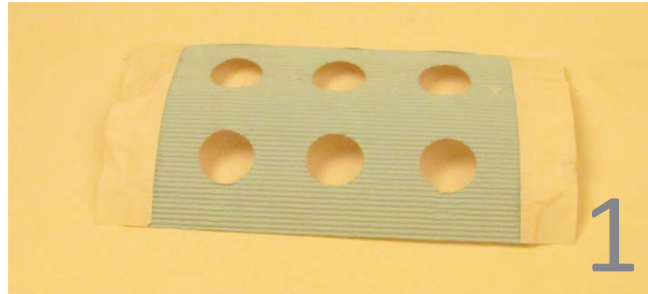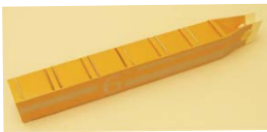
Concept 3
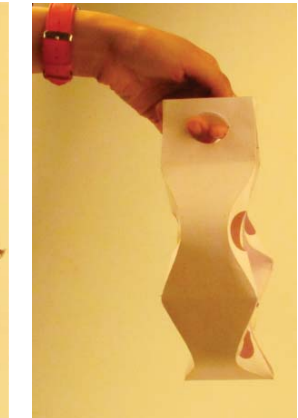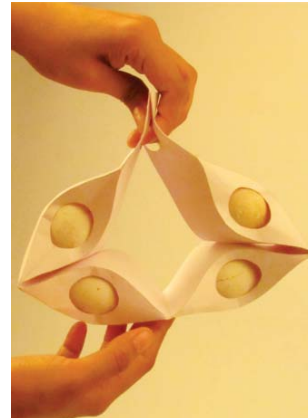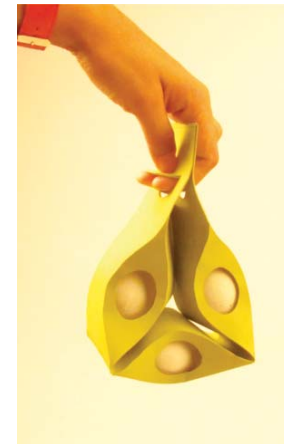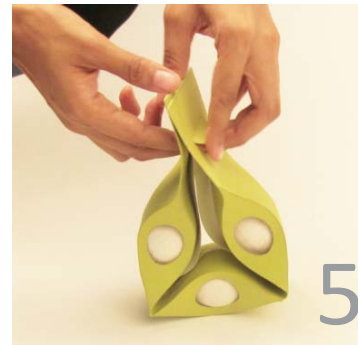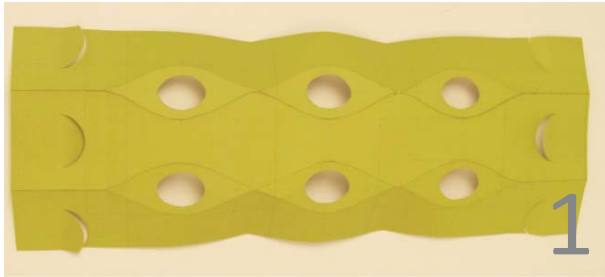
Concept 4

Concept evaluation
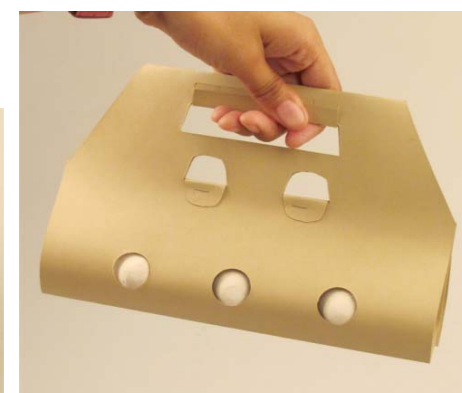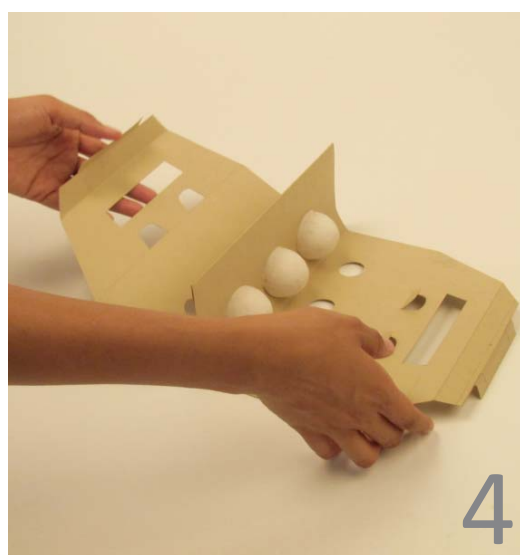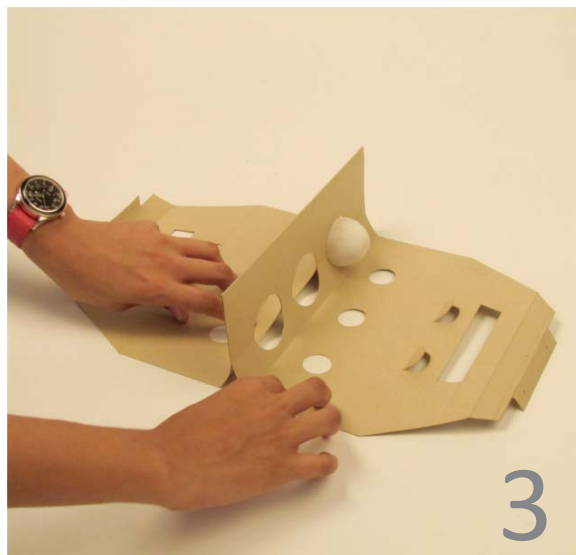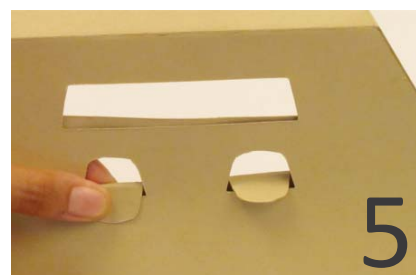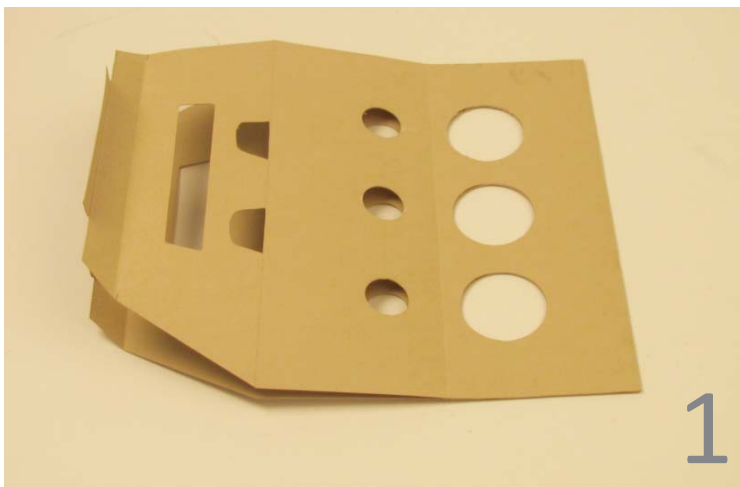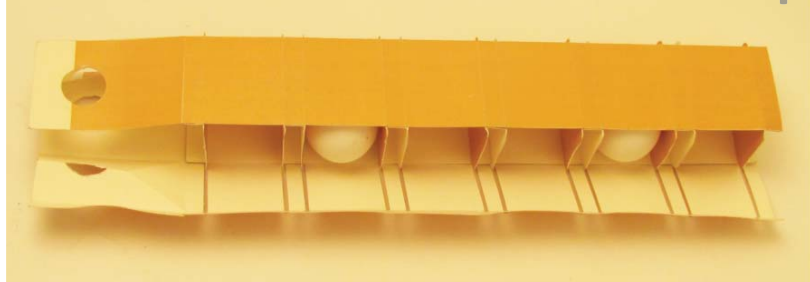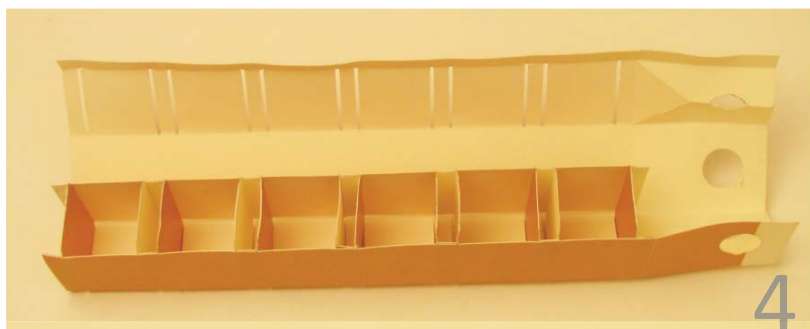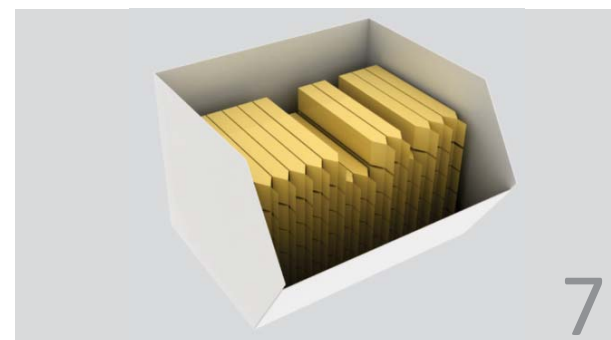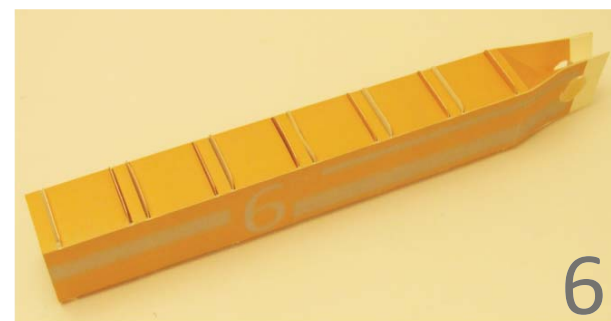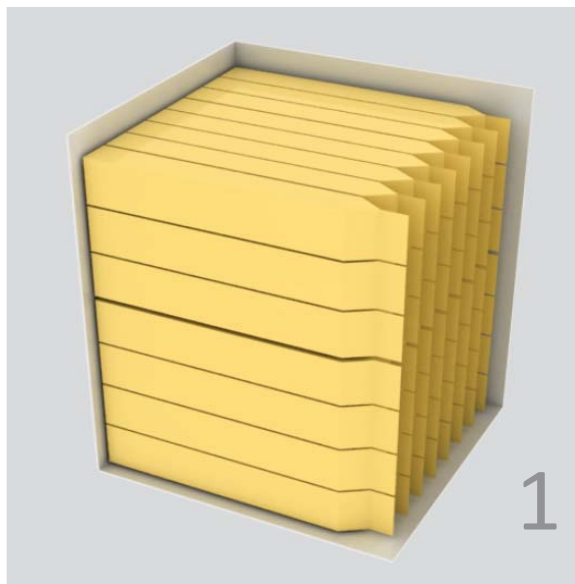
|		Concept 1	Concept 2	Concept 3	Concept 4
1	Stack-ability of the pack	4	2	3	1
2	Nest-ability during bulk packaging	2	3	4	1
3	Ease of packaging eggs	4	2	3	1
4	Strength of the pack (in packed state)	2	4	3	1
5	Kept in a shopping bag	2	4	3	1
6	Size variation in chicken (Indian) eggs	3	4	2	1
7	Spillage in the bag	4	3	2	1
8	Unpacking the eggs at home	4	1	3	2
9	Size of paper used to pack 6 eggs	3	4	2	1
10	Stack-ability of the sheets	3	4	2	1
11	Work ability in lower grade paper	1	4	3	2
12	Brand visibility	2	4	3	1

Final Design

Concept refinement
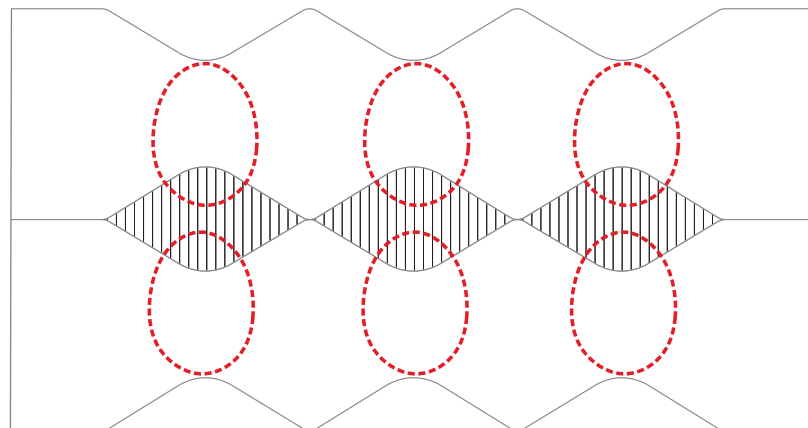
Placement of eggs in the pack

Height reduction in the pack
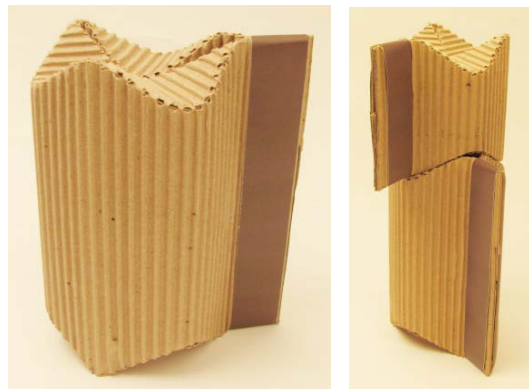
Locking the pack and
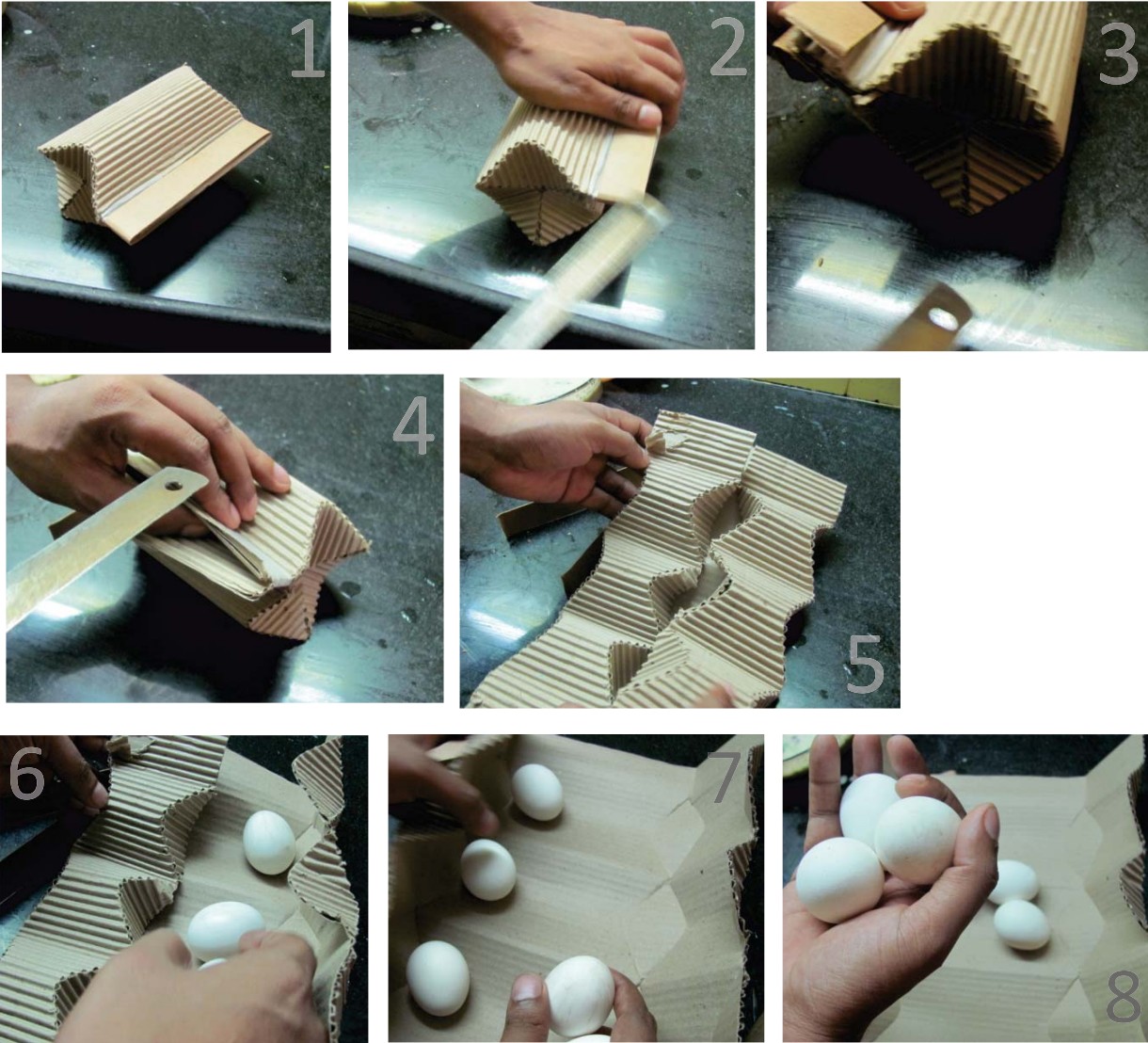the pack handle
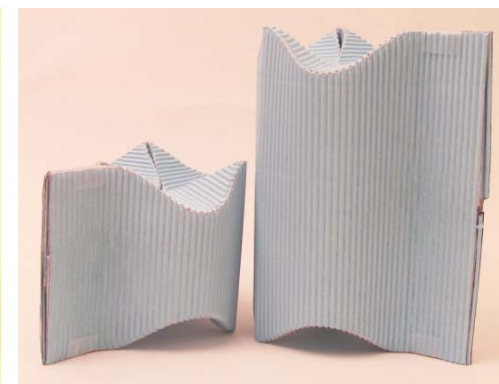
Pack of 3 eggs

Feedback at the shop

- *Do you think this is a packaging for eggs?*
- *What kind of eggs you think are packaged in this?*
- *What could be the price of these 6 eggs?*
- *How do you decide which eggs to buy?*
- *The first words, adjectives which come to your head.*
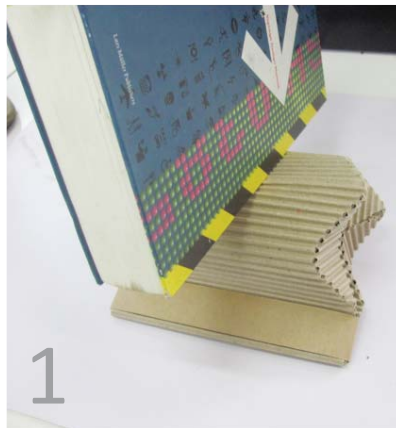 *(Convenient, hi-fy, costly, new, innovative, modern, fresh.)*

Feedback

Observations

- *How the egg pack is held when removing from the shopping bag?*
- *Are the graphics on the pack read at home?*
- *How is the pack opened? What is used to open it?*
- *What kitchen tools are kept nearby?*
- *Where is it placed or held when it is opened?*
- *How are the eggs removed from the packaging?*

Pressure test

Drop test

Paper-mache carton 1
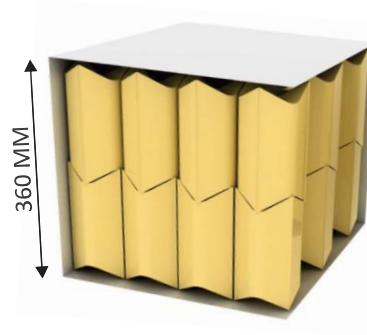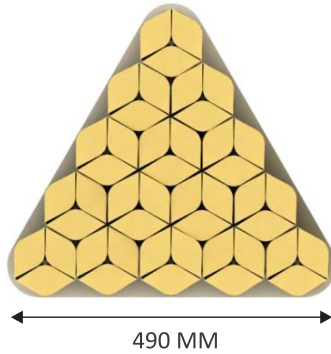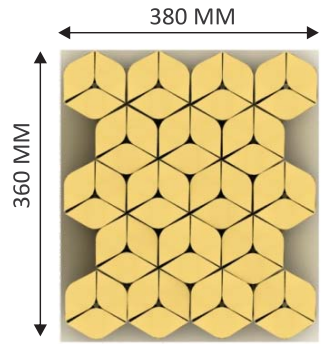

Final concept (thin corrugations) dropped vertically 2

Final concept (thin corrugations) dropped horizontally 3

Final concept (thick corrugations) dropped vertically 4

Bulk packaging

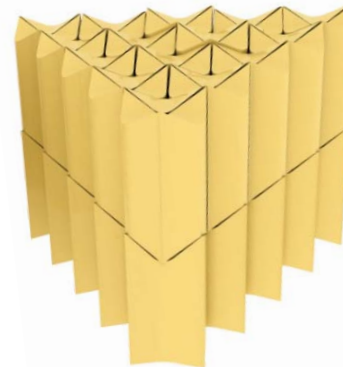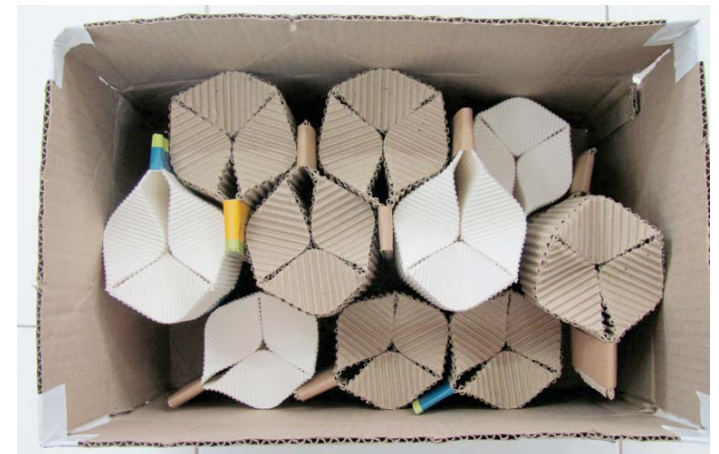380 MM

360 MM

360 MM

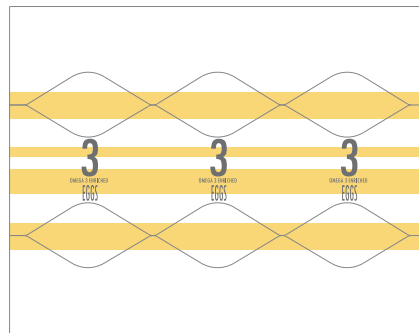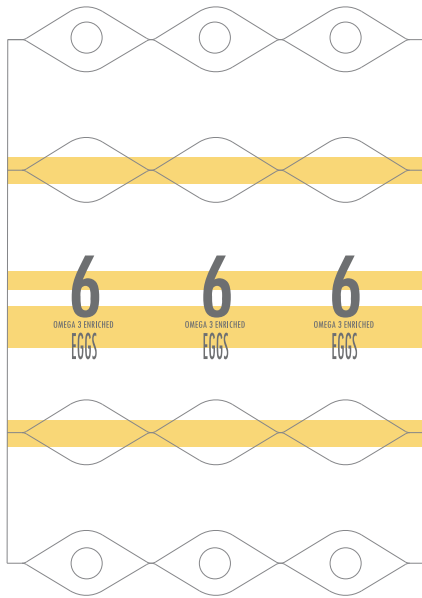=

216 eggs
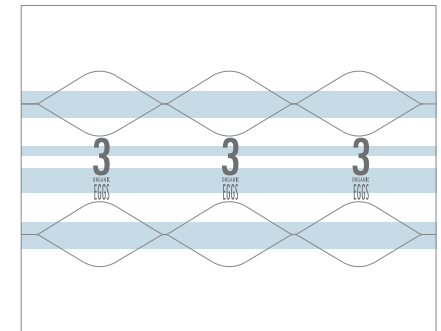(36 packs of 6eggs)

490 MM

360 MM

=
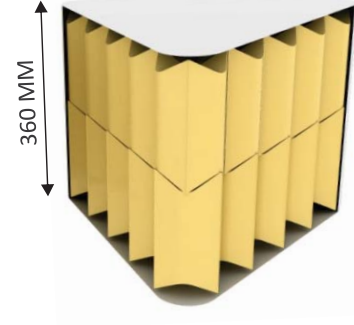
180 eggs
(30 packs of 6eggs)
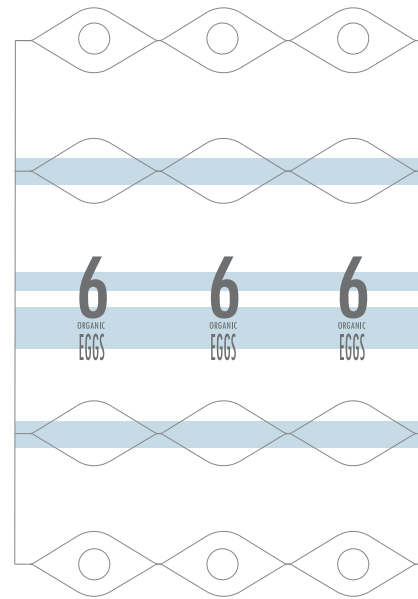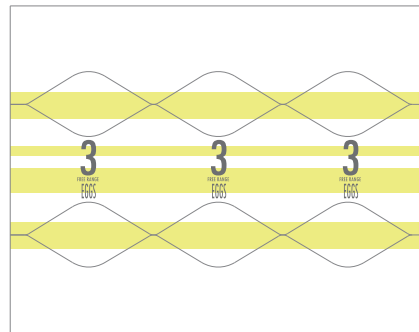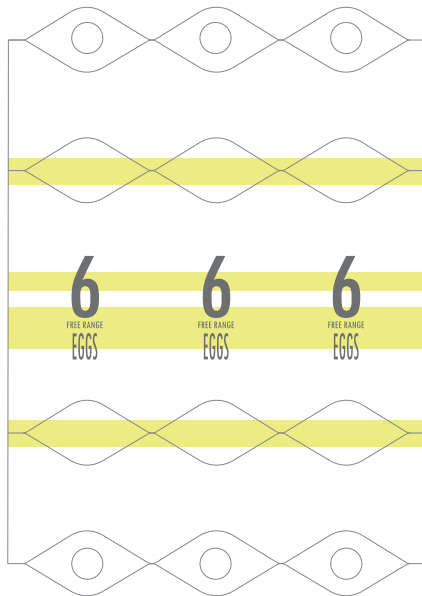
Brand visibility on the shelf

VS

Graphics

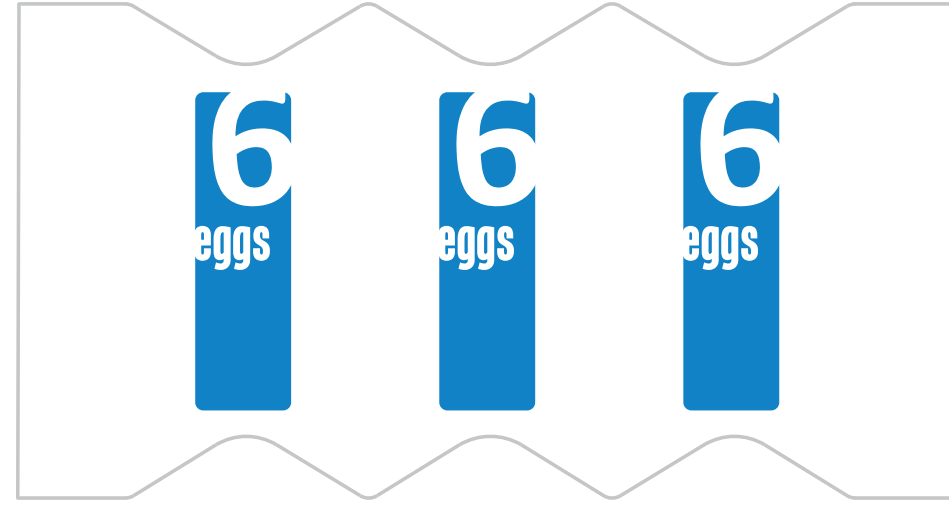

For Omega 3 enriched eggs

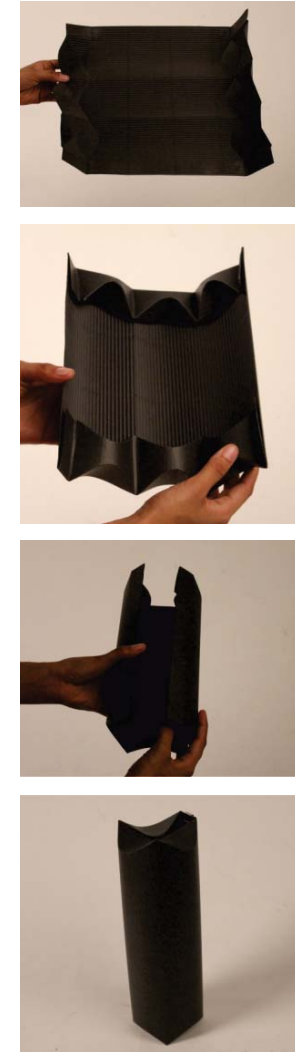For Organic eggs
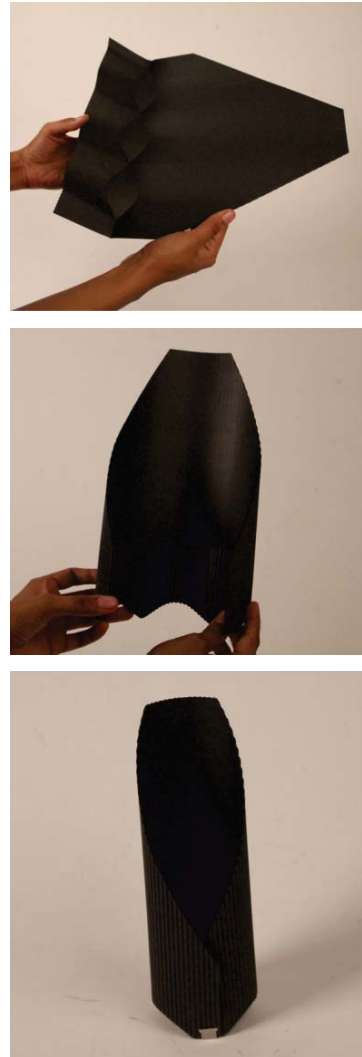

For Free range eggs

Graphics

Final Design

Further use of the folds

Use of folds - Frozen foods, wine bottle, flowers

Thank you