

COUSCOUS : A VERSATILE PROCESS AND PRODUCT



Presented by Mohamed LAMMI

Couscous & rolled products

Characteristics

According to codex alimentarius (Codex Stan 202-1995):

Couscous is a product prepared from durum wheat semolina (*Triticum durum*) the elements of which are bound by adding potable water and which has undergone physical treatment such as cooking and drying.

Couscous is prepared from a mixture of coarse and fine semolina. It can be prepared from “coarse medium” semolina.

Extension

Products intended for the same use but prepared from cereals other than durum wheat may be designated as “couscous” on condition that this appellation be immediately followed by a specification of the cereals used.

Couscous & rolled products

From tradition to modernity

From tradition to modernity



Born in North Africa 3000 years ago

Hand made couscous

17th century
Spread in Europe

18th century
Brazilian version
with corn flour
introduced in
America



60's : industrialization of
couscous production by
French producers

1969 : 1st Turn key plant by
BASSANO/ AFREM

Today, couscous is not only an ethnic food but also a versatile & convenient dish **spreading in world cuisine.**
2nd favourite dish in France.

**In 2010 : 1st couscous festival in Pasadena California
& 13rd couscous fest in Sicily**



CLEXTRAL

A DIVISION OF GROUPE LEGRIS INDUSTRIES

Couscous & rolled products

Characteristics

A starchy dry product versatile and quick to prepare :

- A third transformation product with various sizes of grains
- Long and easy conservation
- Specific dimension for rehydration which is exceptional : the semolina grain
 - It is the rehydration which determines the preparation time of the dry starchy products
 - For pasta, reduction of the thickness
 - For rice, creation of fracture
 - For « Ebly » tender wheat, mastered expansion



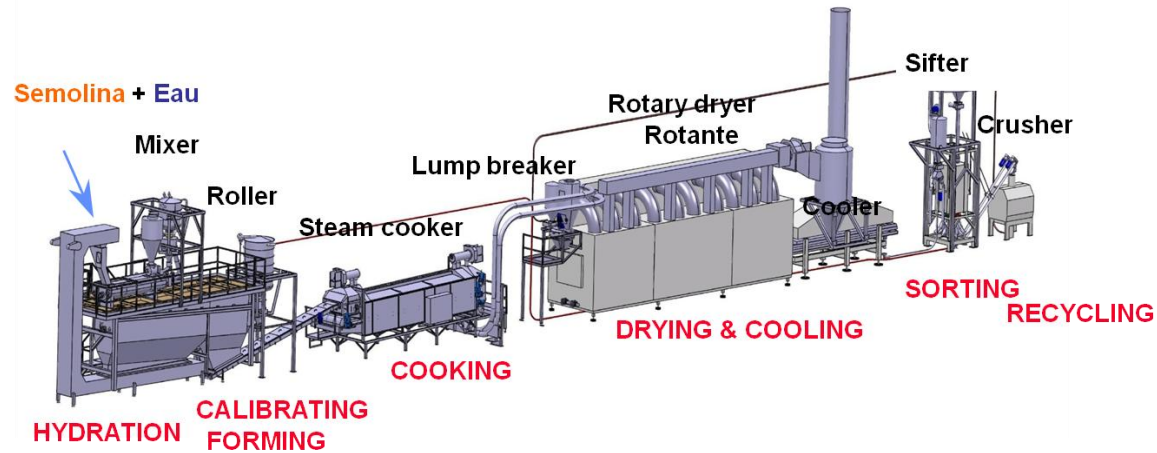
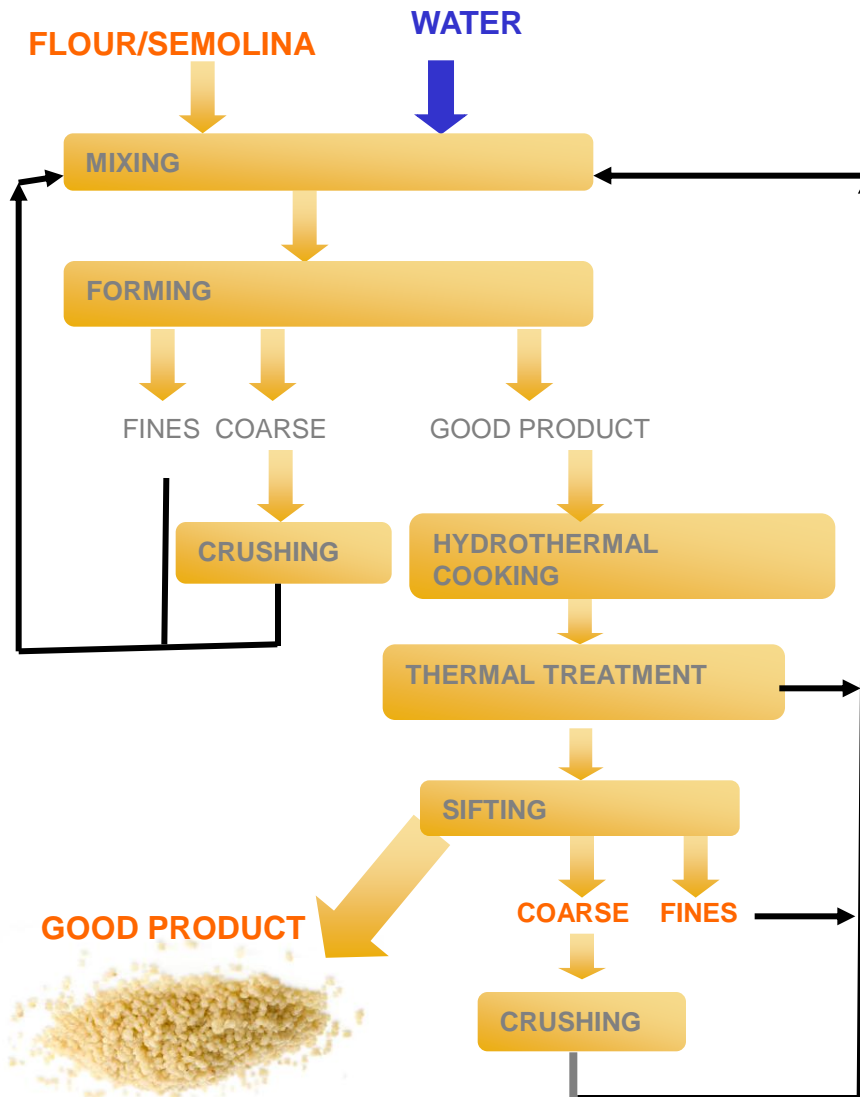
Couscous is the quicker to prepare :

- 5 min rehydration in boiled water
- 1 H rehydration in cold water or sauce (salad like taboulé)



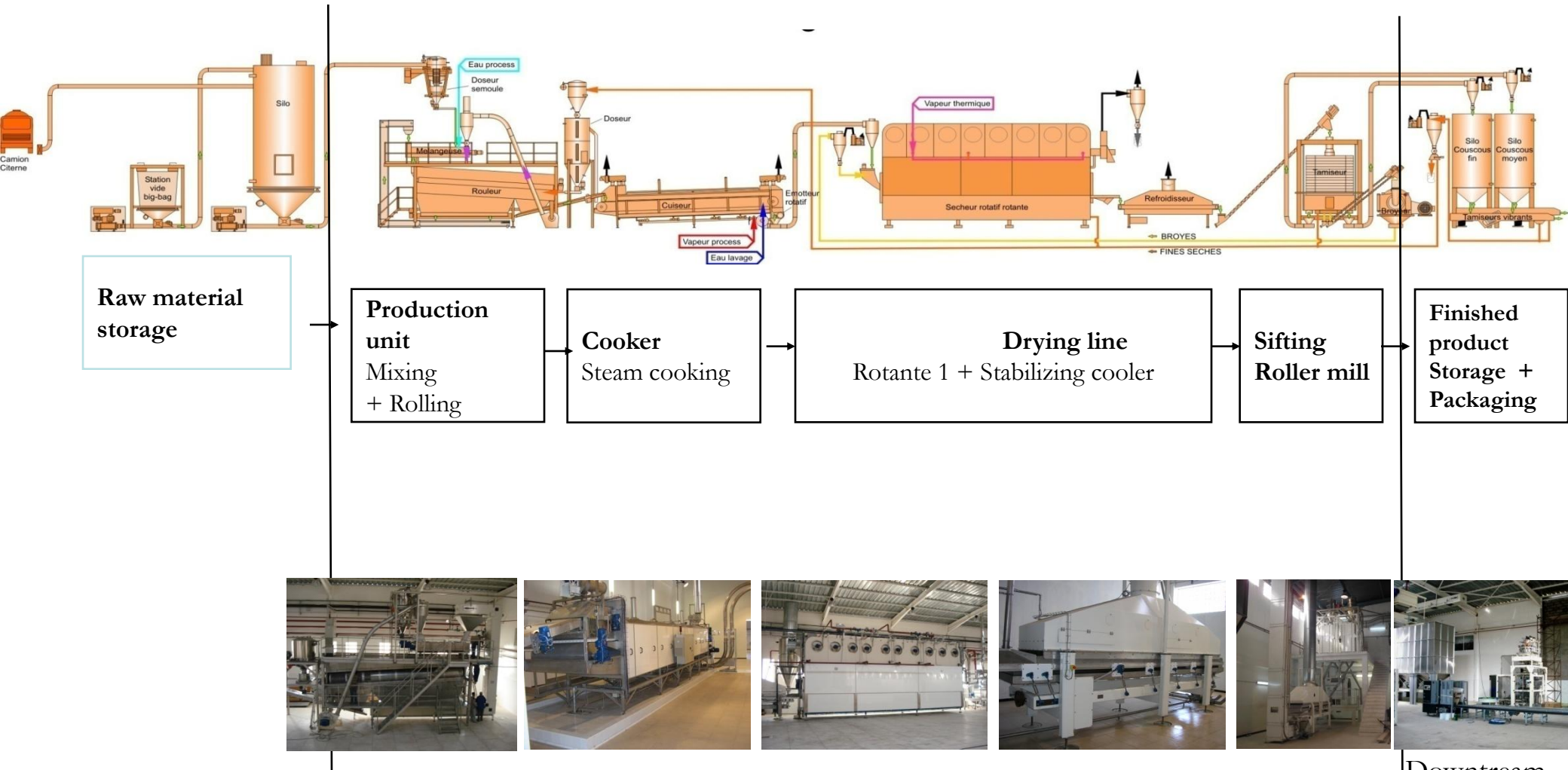
Couscous & rolled products

Process diagram & industrial production



Couscous & rolled products

The industrial process



Upstream

Downstream

Couscous & rolled products

Industrial process – Step 1

Production unit – 2 functions : Mixing/hydration and shaping/sorting

Mixing - Hydration

The hydration of the semolina/flour in the mixer enables :

- Further agglomeration of semolina/flour particles to be able to form the couscous grains
- Sufficient hydration of each starch grain for a high gelatinization after cooking

Agglomeration, rolling, compacting and sorting

Afrem/Clextral chose to develop from the beginning the « Roller », a special equipment for reproducing the hand made process of rolling the grain to agglomerate it.

Other manufacturers use a planchister but it imposes too weak water levels



Couscous & rolled products

Industrial process – Step 1

The Roller in the production unit – a Key element



Couscous & rolled products

Industrial process – Step 2

Cooking : Why is couscous cooked ?

- Make the couscous digestible without any supplementary cooking
- Texture in the mouth (the swelling index is important)
- Solidify the product by « sticking » the particles
- Be able to separate the grains after cooking with less fines generation



Traditional way of cooking couscous
in a « couscoussier »

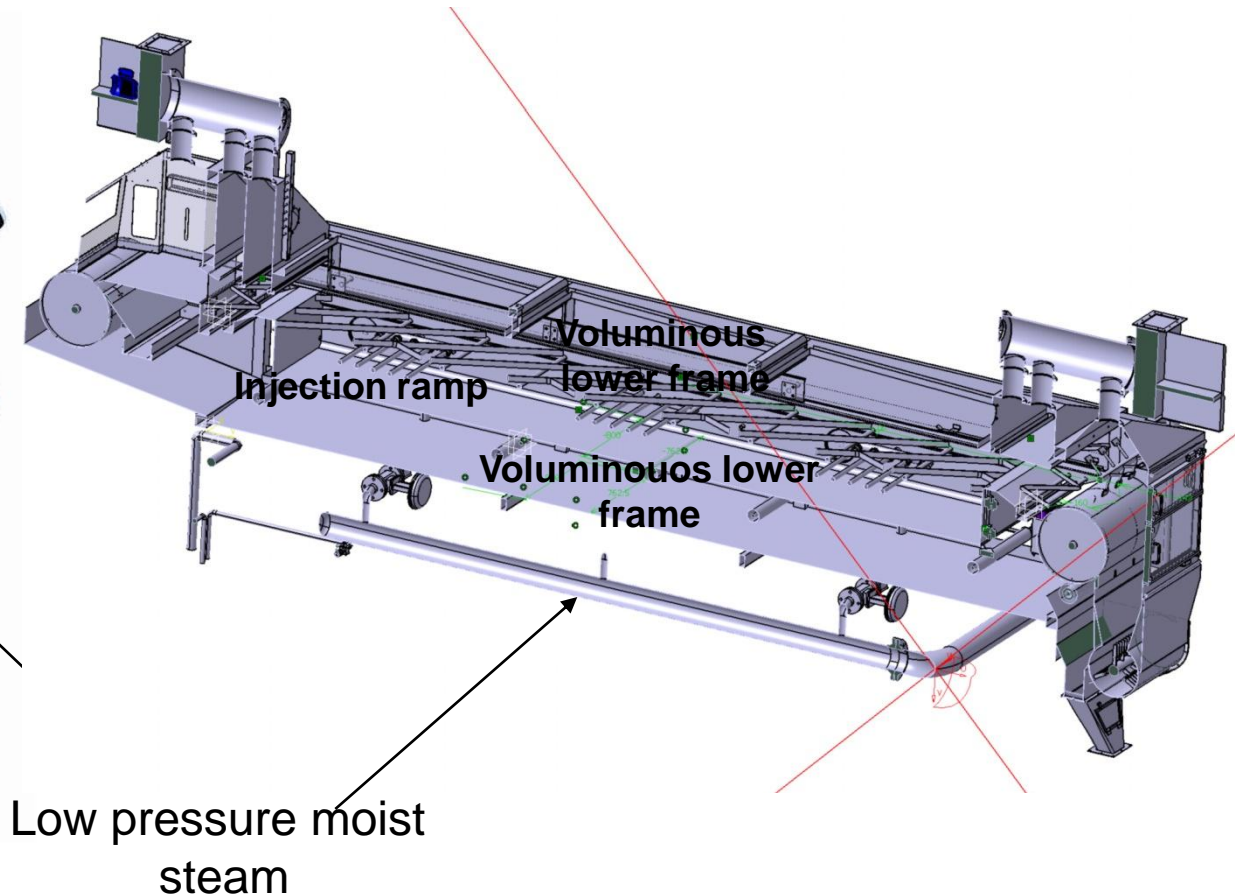
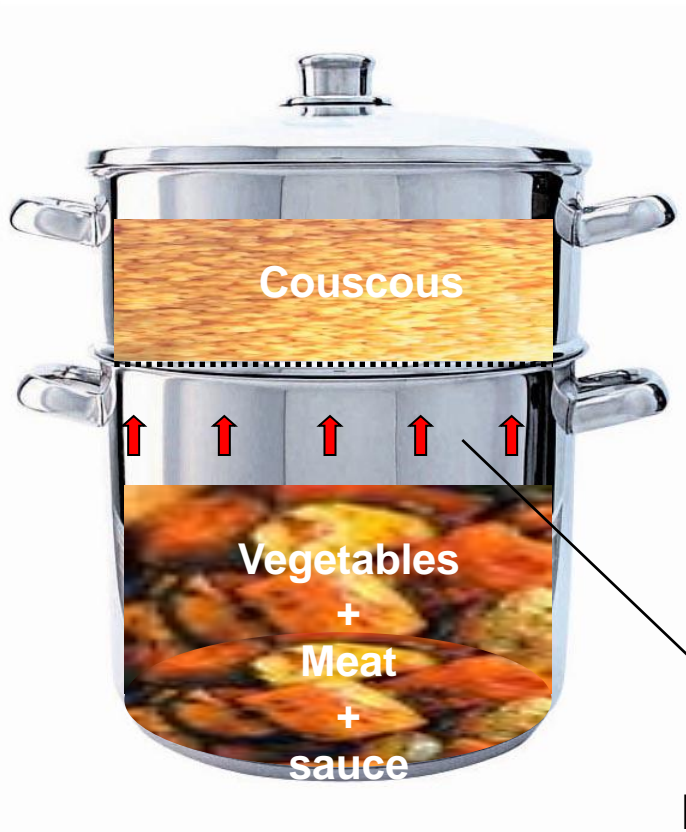


Industrial equipment : steam cooker

Couscous & rolled products

Industrial process – Step 2

Afrem/Clextral cooker : a continuous « couscoussier »



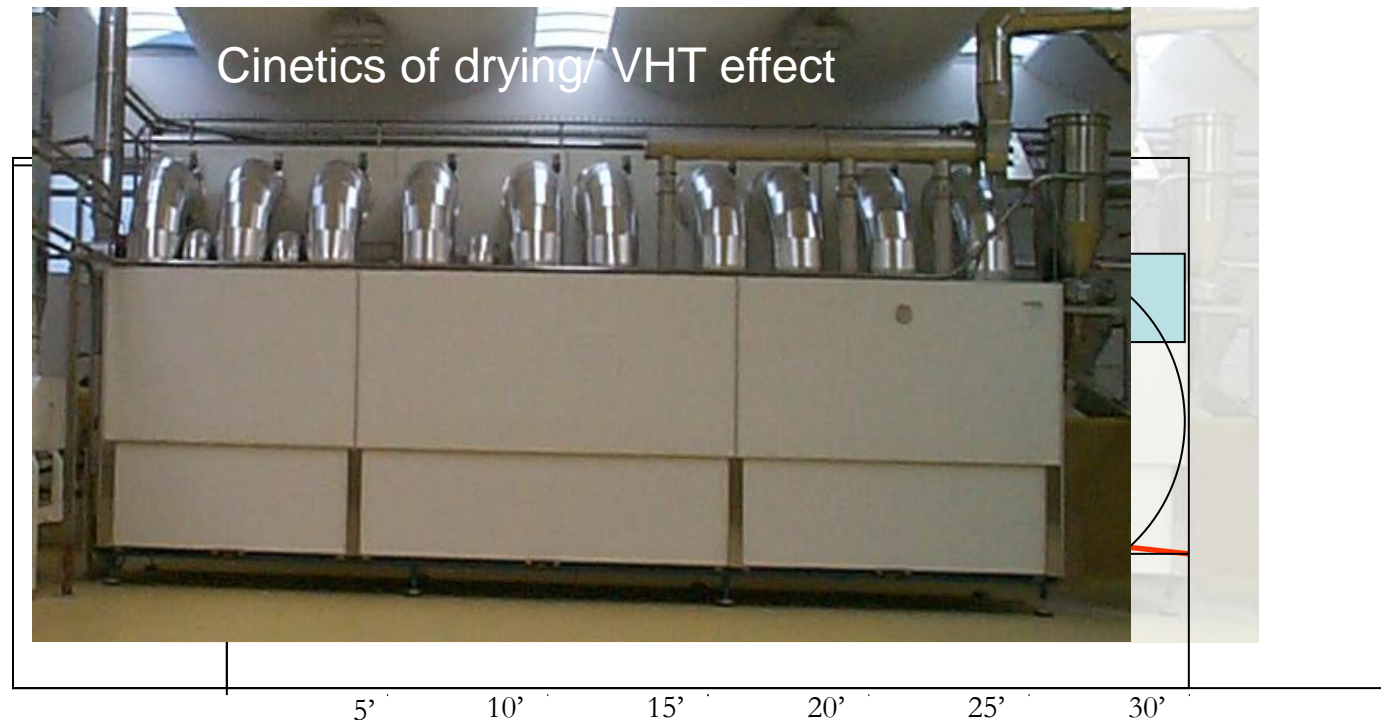
Couscous & rolled products

Industrial process – Step 3

Drying & cooling

Very high temperature drying in Rotary dryer

- The VHT process is adapted to improve quality :
 - High yellow index
 - Drying homogeneity
- Couscous is very easy and quick to dry



Couscous & rolled products

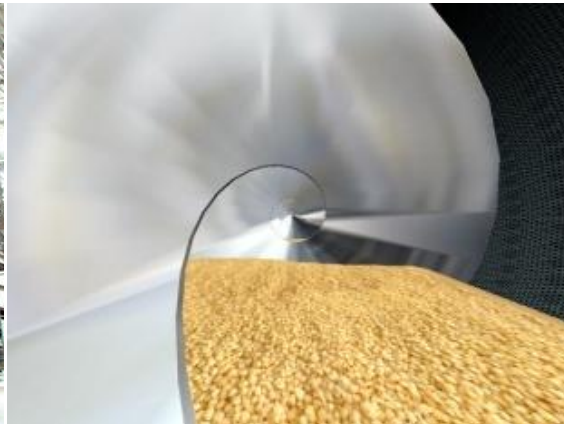
Industrial process – Step 3

EVOLUM® dryer benefits :

High energy efficiency of 860 kCal/KgH₂O

⇒ 90% drying efficiency

- Optimal product surface exposure to heated airflow
- Multiple drying zones
- Uniform, thinner product depth
- Efficient use of airflow & air exhaust
- Reduced air volume in drying chamber
- Consistent Time & Temperature exposure





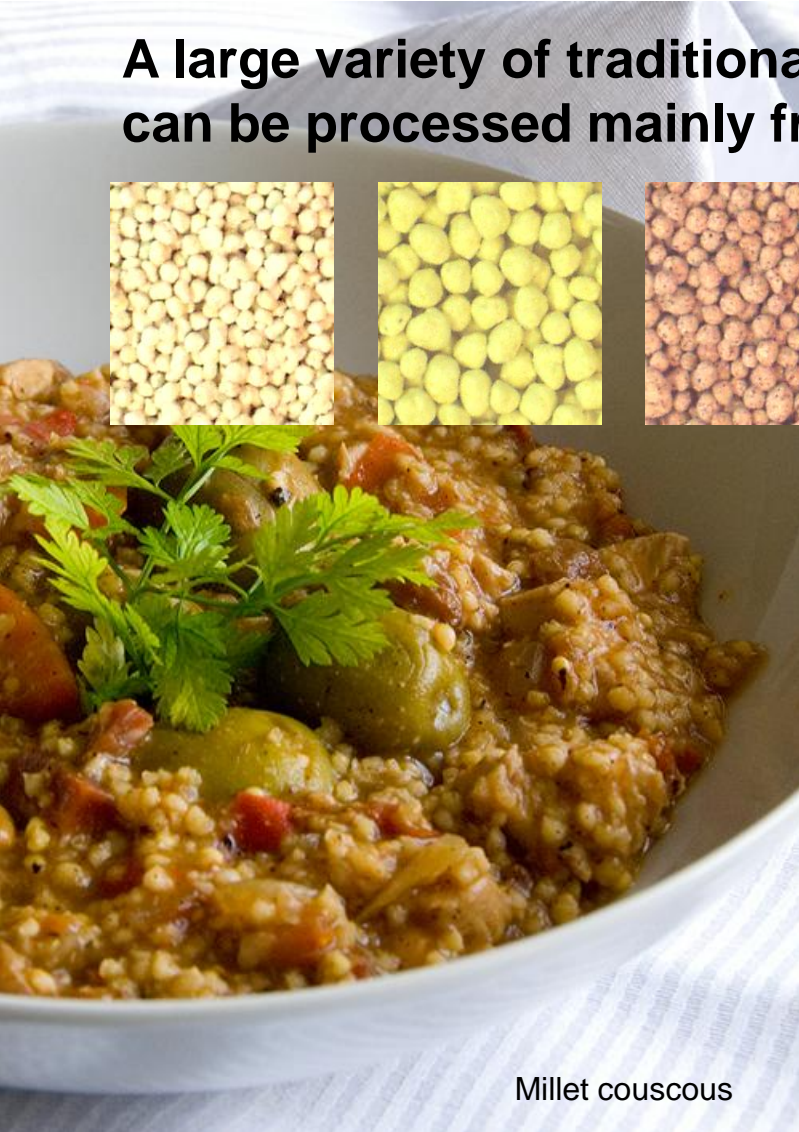
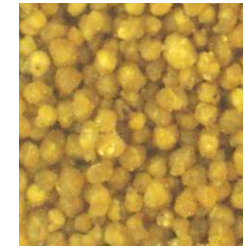
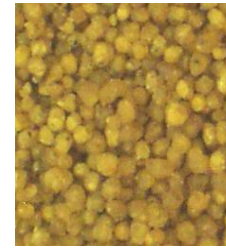
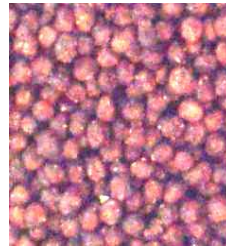
Couscous & rolled products Industrial process

- **A large range of outputs : from 500 kg/h to 3600 kg/h**
- **Installed electrical power adapted to the line output**
- **Product follow up along the process with plc control**
 - Steam injection in the cooker can be piloted (no under or over cooking)
 - Drying zones are adapted and piloted (no under or over drying)
- **Mastering of recyclings**
 - Adapted to the type of product to be recycled

Couscous & rolled products

Different raw materials

**A large variety of traditional rolled couscous
can be processed mainly from gluten free raw materials**



Millet couscous

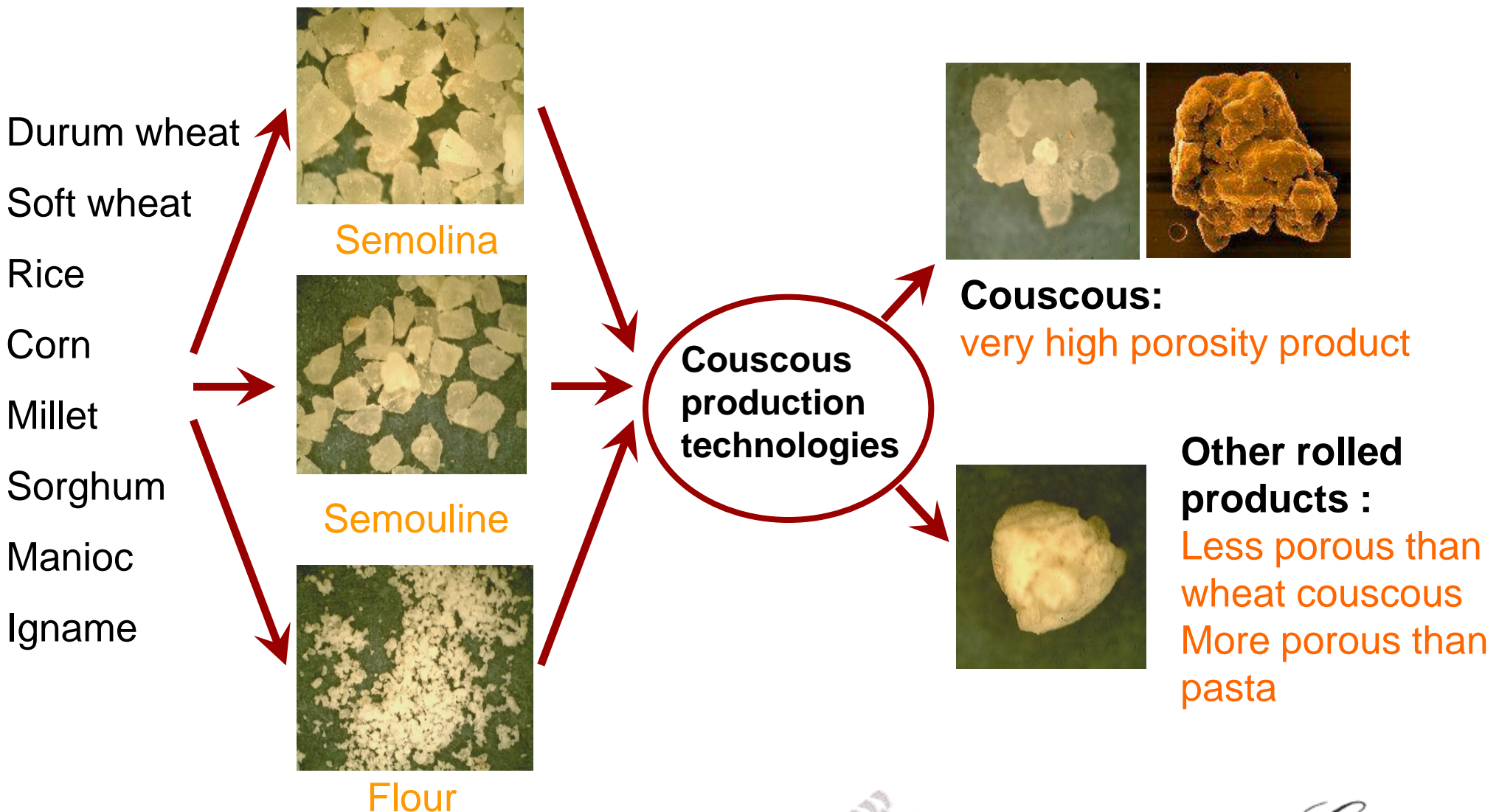
Wheat couscous is well industrialized as well as other type of couscous from different raw materials.

The same process can be used

The industrial equipment has a high potential of evolution

Couscous & rolled products

Different raw materials

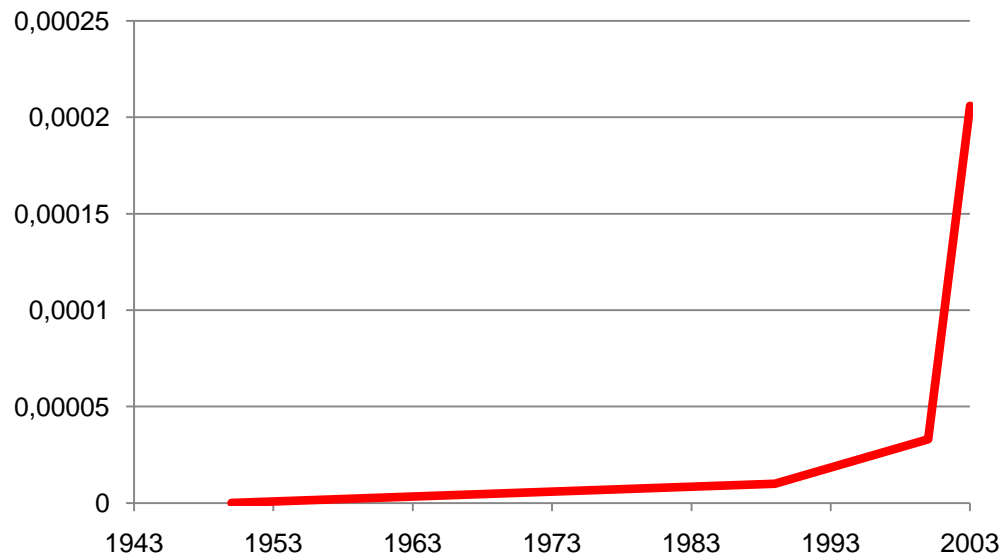


Couscous & rolled products

Different raw materials

Non wheat raw materials : the Gluten-free claim

**Gluten free diets are more and more requested.
The gluten free market is growing in industrialized countries.**



% evolution of celiac intolerance 1980 – 2003

Not only couscous... but also more cuscuz

