

**FIBRE**

## DIETARY FIBRE

The first dietary fibre [1] definition in 1972 sought to describe the plant structures and components that were responsible for mediating these health benefits: “that portion of food which is derived from the cellular walls of plants and is digested very poorly by human beings...”

The second the physiological actions of DF are likely based on their physicochemical properties such as water- and oil-holding capacities, water- and oil-retention capacities, and absorption of organic molecules, bacterial degradation, cation-exchange capacity, and antioxidant activity.

## THE FOOD AND DRUG ADMINISTRATION (FDA) HAS APPROVED TWO HEALTH CLAIMS FOR DIETARY FIBRE.

The first claim states that, along with a decreased consumption of fats (<30% of calories).

The second an increased consumption of dietary fibre from fruits, vegetables and whole grains may reduce some types of cancer [2].

## EPIDEMIOLOGICAL AND CLINICAL STUDIES DEMONSTRATE:

- That intake of dietary fibre and whole grain is inversely related to obesity,
- Type two diabetes [3],
- Cancer[4],
- Cardiovascular disease (CVD) [5],
- Regulation of appetite [6],
- Stimulation of bowel function [6],
- Medium water binding [6].

## SPAIN

The Spain fibre consumption has been increased from 21 g/day in 1994 to 26 g/day in 2002. The SENC recommends a daily intake of more than 25 grams of dietary fibre.

## THERE ARE MORE THAN 60 DIETARY FIBRES ON THE MARKET

World prices of the fibre, are approximately equal for all countries, and range from 5 €/kg to 25 €/kg [7].

## TECHNICAL APPLICATION OF THE FIBRES. IT IS USED IN MORE THAN 500 FOOD PRODUCTS

- Such as: preserves,
- yoghurts,
- aromatic agents,
- pastries and etc....
- In addition it is used in medical products.

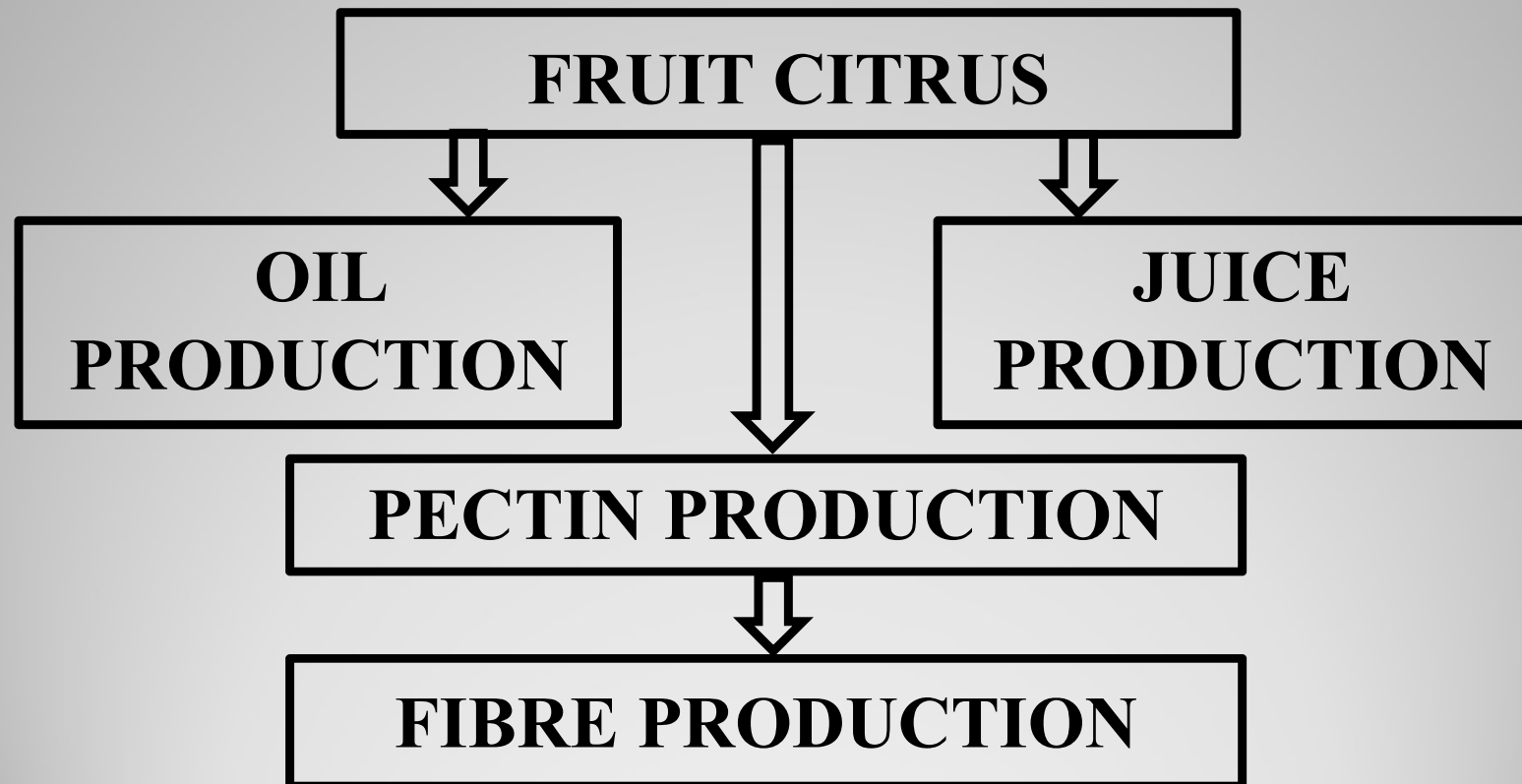
The each specific process, for example, preserves, confectionery, etc... Is used a particular type of fibre, which is defined by its level of color, particle sizes, pH, and his ability to WHC, OHC, 1% and 5% viscosity of suspension, WSI fundamentally.

## THE DIETARY FIBRES CAN BE DIVIDED IN TO TWO GROUPS

In the first groups, the content of insoluble pectin fraction is approximately equal to fruit's content.

In the second groups, the content of insoluble pectin fraction is significantly low.

# THE GENERAL CHARACTERISTICS OF THE FIBRE PRODUCTION





# THE OUR TECHNOLOGY IS ADVANCED OF TECHNOLOGIES

## **Technology (A)**

The contents of water soluble pectin fraction and insoluble pectin fraction of dietary fibres from the first group.

## **Technology (B)**

The contents of water soluble pectin fraction and insoluble pectin fraction of dietary fibres from the second group.

## PRESENT PROCESS OF THE FIBRE PRODUCTION AFTER JUICE EXTRACTION

This technology uses for industry production of neutral fibres, dietary fibres. This technology uses for industry production of dietary fibre as well as bioactive compounds such as polyphenols and essential oils, providing economic benefit to the food, cosmetic and pharmaceutical industries. They are obtained by treatment of raw materials for pectin production and pectin modification. They are obtained without any additional purification steps. Thereby they are obtained by short technological cycle, and shorter time. This fibre is valid for consumption.

## DRYING STEP WET FIBRES

- Pulse combustion dryer.
  - Spray equipment.
  - Gouda double drums with chrome plated.
  - Boiling bed dryer
- -is suitable for drying fibres with 6-7% humidity.
  - - is suitable for drying citric fibres with 6-11% humidity.
  - - is suitable for drying pectin, fibres, etc. with 6-15% humidity.

## PARAMETERS OF THE FIBRES

- Fraction of 0,100-0,250 mm particles sizes;
- Mixture fraction of 0,100 mm and 0,250 mm particles sizes;
- Humidity: 10-12%;
- WHC, g/g: the range from 10g/g to 21 g/g;
- OHC, g/g: the range from 0,2g/g to 5,4 g/g;
- Viscosity 1% suspension: the range of 6,5-166,5 mPas\*s;
- Viscosity 5% suspension: the range of 100-21000 mPas\*s;
- WSI: the range from 1,79% to 17%;
- pH: 4,3-5,0;
- L\*: 74-87;
- a\*: -0,7-0,9;
- b\*: 14-23.

## PROPERTIES OF DIETARY FIBRES

Technological functionality	Technological functionality depends on the structural features of dietary fibres
WHC	Concentration of insoluble pectin, MW of insoluble pectin; grade esterification of insoluble pectin
OHC	Concentration of soluble pectin; concentration of insoluble fibre
WSI	Concentration of soluble fibre; pH; concentration of sugars
Viscosity 1%	pH; MW of soluble pectin; content of galacturonic acid in the soluble pectin
Viscosity 5%	pH; content of galacturonic acid in the soluble and insoluble pectin; grade esterification of the soluble and insoluble pectin.

## THE OUR TECHNOLOGY (B)

The contents of water soluble pectin fraction and insoluble pectin fraction of dietary fibres from the second group.

Unit, g/100g of dry dietary fibres	The water soluble pectin fraction of fibres	The insoluble pectin fraction of fibres
Concentration	18,3	12,0
	19,3	15,4
	19,9	23,1
	37,1	21,9
	30,3	10,7

## SPECIFICATION (M2011) OF MARKET PRODUCTS

Characteristics	Specifications
Appearance	Marfil Powder
Assay	100%
Appearance of solution	Clear and colorless
Appearance of suspension	Clear and marfil
Appearance of 5% suspension	Without precipitate
WHC	10,2g/g±0,8
OHC	1,92g/g±0,18
WSI	10,2%±1,3
Viscosity 1% suspension	9mPas*s ±0,01
Viscosity 5% suspension	367mPas*s±16
L*	81,6-82,0
a*	-0,47-0.86
b*	17,8-21,3
pH	4,36±0,16

## THE TECHNICAL AND ECONOMIC PARAMETERS

- **PRODUCTION OF  
THE FIBRES:**
- DAY           1600kg
- YEAR          400t



## COSTS PRODUCTION

The following costs of production have been made taking into account all consumption, both energies and raw per hour at full load and for the production of about 89 kg per hour of commercial fibres.

- **TOTAL ANNUAL 200.000,00€**
- **INCLUSIVELY DRYING STEP 0,37-0,42€/kg (fibre)**

**PRICE OF 1 KG OF THE DIETARY FIBRE: 1,5€**

**THE VOLUME OF ANNUAL SALES: 600.000,00€**

**THE ANNUAL BENEFIT: 400.000,00€**

**RESULTING IN ANNUAL PROFIT: 3,0%**

## NEW TECHNICAL APPLICATIONS OF OUR FIBRES

- May be used successfully in the production:
- jams,
- jellies,
- fruit spreads,
- confectionery,
- foamed candy products,
- whipped fruit cream,
- for stabilization of cream, ice cream and ice desserts,
- for stabilization of whey and whey mix products.

## **THE OUR FIBRES MAY BE USED FOR THESE PRODUCTS (1)**

### **FIBRES FOR DIETARY PRODUCTS:**

- Fewer calories;
- Feeling of satiety.

### **FIBRES FOR JUICE**

- Can be used in cloudy juices as replacement of natural fruit particles.

### **FIBRES FOR SAUCES & FINE FOODS:**

- Improved quality;
- Better viscosity;
- Improved freeze-thaw stability.

## THE OUR FIBRES MAY BE USED FOR THESE PRODUCTS (2)

### **FIBRES FOR MEAT & FISH BALLS:**

- Improved texture and satisfaction;
- Limited losses during heat treatment;
- Better freeze-thaw stability;
- Increased yield.

### **FIBRES FOR PASTA:**

- Improved quality;
- Shorter cooking time;
- Improves rheology and bite of ready dishes;
- Ideal additive for all instant products. Improves instant hydration, acts as anti clogging agent gives better mouth feeling.

## THE OUR FIBRES MAY BE USED FOR THESE PRODUCTS (3)

### **FIBRES FOR WAFERS & COOKIES:**

- Lower transport and packing losses;
- Longer shelf life;
- Quicker baking process;
- Improved crispiness;
- Flavor carrier;
- Better freeze-thaw stability.

## THE OUR FIBRES MAY BE USED FOR THESE PRODUCTS (4)

### **FIBRES FOR BAKED GOODS:**

- Longer shelf life;
- Better crust formation;
- Improved crispiness;
- Better texture;
- Anticaking agent for baking mixes;
- Flavor carrier;
- Better freeze-thaw stability.

## **THE OUR FIBRES MAY BE USED FOR THESE PRODUCTS (5)**

### **APPLICATIONS FOR MEAT PRODUCTS**

Our water and fat absorbing fibres have a number of advantages to introduce to modern product formulas. They are ideal for injection as well for stabilizing emulsion in many kinds of products.

- **Sausages**
- **Ham**
- **Fine Minced Products and Pate**
- **Salami**
- **Culinary Meat**
- **Hamburgers**
- **Fresh Meat and Poultry**



# GELLING AND STABILISATION PROPERTIES OF THE FIBRES



## REFERENCES

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