WORKSHOP ARGENTINA-JAPAN
“Bioscience and Biotechnology for the Promotion of Agriculture and Food Production”
August 3rd to 7th 2009
TECHNOLOGIES FOR THE PRODUCTION OF FUNCTIONAL FOODS, HEALTHY FOODS, FOODS FOR SPECIAL DIETS AND THEIR INGREDIENTS, FROM WHOLE GRAINS

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INTI-Cereals and Oilseeds
OUR MISSION

INTI is a public service for the generation, development and transfer of industrial technology
OUR ROLES

FIRST ROLE

Technical referent for the implementation of product identity and quality regulations in industry and commerce.
SECOND ROLE

Technologically responsible for people’s integration into the productive system.
OUR ROLES

THIRD ROLE

Public assistant for furthering industrial competitiveness.
MAIN SERVICES CURRENTLY DELIVERED

Innovation and development
Technology transfer
Technical Assistance, Analyses and Tests
Calibrations
Voluntary and mandatory certifications
Interlaboratory tests
Audits
Extension
Training
Personnel qualification
RESEARCH and DEVELOPMENT CENTRES

- Cellulose and Paper
- Cereals and Oilseed Products
- Chemistry
- Constructions
- Dairy Products
- Electronics and Informatics
- Energy
- Environment
- Soft Technologies and Development
- Fruits and Vegetables
- Leather
- Meat
- Mechanics
- National Security Regulations for Civil Constructions
- Packaging
- Physics and Metrology
- Plastics
- Rubber
- Superficial Processes
- Technologies for Health Care and the Handicapped
- Textiles
- Wood and Furniture
INTI – RESEARCH AND DEVELOPMENT CENTRES RELATED TO FOODS

FRUITS AND VEGETABLES (MENDOZA)

MILK (RAFAELA)
CEREALS AND OILSEEDS (9 DE JULIO)
MILK-MEAT-CEREALS AND OILSEEDS (MIGUELETE)
FISH (MAR DEL PLATA)
INTI - CEREALS AND OILSEEDS

- HEAD OFFICE
  9 de Julio
  Buenos Aires province
INTI - CEREALS AND OILSEEDS

- MIGUELETE SITE
INTI - CEREALS AND OILSEEDS

AREAS

- OILSEEDS, OILS, FATS, BY-PRODUCTS AND RELATED PRODUCTS
- CEREALS AND MEALS, BY-PRODUCTS AND RELATED PRODUCTS
- JUICES, HONEY, SUGAR PRODUCTS, BEVERAGES AND RELATED PRODUCTS
- NUTRITION
- PROCESSING TECHNOLOGIES
- FOOD LEGISLATION
- MICROBIOLOGY
- TOXICOLOGY
- QUALITY MANAGEMENT
- ENVIRONMENT
OILSEEDS, OILS, FATS, BY-PRODUCTS AND RELATED PRODUCTS

- Oilseeds
- Vegetable and animal oils and fats
- Cocoa butter and chocolate
- Oilseed industry by-products
- Enriched foods
- Feeds and pet foods
- Soybean food products
CEREALS AND MEALS, BY-PRODUCTS AND RELATED PRODUCTS

- Wheat, oats, sorghum, rice, amaranth and other cereals
- Milling, meals and related products
- Wheat, mandioca, potato and rice starches
- Bakery products
- Crackers
- Pasta
- Snacks and breakfast cereals
- Dough conditioners
NUTRITION

- Vitamins
- Functional foods
- Bioactive Compounds
- Foods for special dietary uses
- Dietary Supplements
PROCESSING TECHNOLOGY, PRODUCTS AND PROCESSING DEVELOPMENT, FEASIBILITY RESEARCH, FACTORY SETTLEMENT ASISTANCE

- Oilseeds and oilseed meals
- Cereals, cereal meals and related products
- Honey, sugar products and fruit juices
- Vegetables
- Animal oils and fats
- Food additives
MICROBIOLOGY

- Cereals, oilseeds and related products
- Bakery products
- Oils and fats
- Feeds and pet foods
- Salad dressings and margarine
- Sugar, honey, marmalades, jellies, corn syrup, juices, nectars, carbonated and non carbonated non alcoholic beverages
- Coffee, tea, mate, herbs, species
- Phytotherapeutics
- Water, mineral water, soda water
- Catering
TECHNOLOGIES FOR THE PRODUCTION OF FUNCTIONAL FOODS, HEALTHY FOODS, FOODS FOR SPECIAL DIETS AND THEIR INGREDIENTS, FROM WHOLE GRAINS
A few major risk factors account for much of the morbidity and mortality
For non communicable diseases, the most important risks include:

- high blood pressure
- high concentrations of cholesterol in blood
- inadequate intake of fruit and vegetables
- overweight and obesity
- physical inactivity
- tobacco
Factors that increase the risks of these diseases include:

- Elevated consumption of energy-dense, nutrient-poor foods that are high in fat, sugar and salt
- Reduced levels of physical activity
- Tobacco
DIETARY RECOMMENDATIONS FOR POPULATIONS AND INDIVIDUALS

- Achieve energy balance and a healthy weight
- Limit energy intake from total fats and shift fat consumption away from saturated fats to unsaturated fats and towards the elimination of trans-fatty acids
- Increase consumption of fruits and vegetables, legumes, whole grains and nuts
- Limit the intake of free sugars
- Limit salt (sodium) consumption
DISQUALIFYING NUTRIENTS

• Saturated fat
• Trans fat
• Sodium

GOOD NUTRIENTS

• Unsaturated fat
• Polyunsaturated fat
• Dietary fiber
• Protein
• Vitamins and minerals
NATURALLY HEALTHY FOODS

Foods that naturally have a health promoting or disease-preventing property beyond the basic and traditional function of supplying nutrients.
FUNCTIONAL FOODS

Foods that are designed to have a health promoting or disease-preventing property beyond the basic and traditional function of supplying nutrients.
AT PRESENT, WHAT DO CONSUMERS LOOK FOR?

• Healthy, nutritious and easy to prepare foods

• Functional and natural foods

• Foods with a minimum of processing and less quantities of synthetic ingredients

• Safe and low-priced foods
FROM A GLOBAL POINT OF VIEW

- Very competitive market
- Great pressure upon costs
- Requires innovation and new technologies
INTI - CEREALS AND OILSEEDS

AIMS

• To give an answer to these challenges

• To achieve an effective impact on society’s health and life quality
DEVELOPMENT, PRODUCTION AND TECHNOLOGICAL TRANSFERENCE OF:

- Functional and Healthy Foods
- Foods for Special Dietary uses
- Foods for Special Feeding Programs

FROM CEREALS AND OILSEEDS

- Low cost and highly available raw materials
PROJECTS THAT ARE BEING CARRIED OUT
TECHNOLOGICAL TRANSFERENCE OF EXTRUSION-PRESSING PROCESS

• High temperature/short time process

• May affect the non-nutritive factors

• Constitutes a valuable tool to improve the nutritional quality of foods
TECHNOLOGICAL TRANSFERENCE OF EXTRUSION-PRESSING PROCESS

• Innovative

• High performance

• Low cost

• Production of high added value products
TECHNOLOGICAL TRANSFERENCE OF EXTRUSION-PRESSING PROCESS

FIRST PRESS OILS

- Soybean
- Sunflower
- High oleic sunflower
- Linseed
- Canola
ANUGA
Food and Beverage Trade Fair
TECHNOLOGICAL TRANSFERENCE OF EXTRUSION-PRESSING PROCESS

SEMI-DEFATTED FLOURS

• Soybean
• Linseed
FACTORY SETTLEMENT ASISTANCE
FACTORY SETTLEMENT ASISTANCE
FULL FAT FLOURS

- Oats
- Rye
- Barley
- Wheat
- Forage bean
- Multigrain

(linseed, forage bean - *Pisum sativum* L. var. laguna-, soybean, wheat bran, wheat germ)
Forage bean

• The extrusion processes caused a reduction in β-galactoside content and a sharp drop or total removal of trypsin inhibitor activity of bean flour.

• Although the thiamine content decreased very deeply after these processes, slight changes were observed in the other nutritive compounds.

• Then, extruded bean could be considered as a novel product with high nutritive value.
FOODS FOR SPECIAL DIETS

- Cereal Bars
- Meals for old people
- Meals for people with diabetes
- Meals for people with celiac disease
- Meals for people with phenylketonuria
- Healthy snacks
DEVELOPMENT OF ESPECIAL MEALS

- Composite meals for feeding programs
- Composite meals for emergency situations

Prepared meals with higher nutritional value

- Semi-defatted soy meal
- Whole corn meal
CEREAL BARS

NUTRITIONAL BARS FOR SCHOOL CHILDREN

• Corn, oats, rice
• Ovoalbumin as source of high BV protein
• First press soybean oil as source of polyunsat. fatty acids
• Honey

The cereals used are whole grain and texturized
Sensory evaluation was made with 120 school children between 9 and 11 years old
INDUSTRIALIZATION OF
BY-PRODUCTOS FROM GRAIN
PROCESSING
PRODUCTS DEVELOPED

- Stabilized wheat bran and germ
- Stabilized corn bran and germ
- Brewery spent malt
- By-products from wet corn and wheat milling
• Raw wheat germ, which contains as much as 10% oil, begins to go rancid as soon as it is milled and becomes completely rancid in as little as 72 hours.

• The process can inactivate the enzymes without significant damage to nutrients, including vitamins and minerals.

• The resulting product has a longer shelf life at room temperature.
DEVELOPMENT OF MEALS AND DERIVATIVES (FLAKES, EXPANDED PRODUCTS) FROM NO TRADITIONAL GRAINS
INTI – Cereales y Oleaginosas

GRAINS THAT JUST IN THE PAST FEW YEARS HAVE BEEN REDISCOVERED. THEY WERE A STAPLE FOOD IN THE DIET OF THE ANCIENT INCA AND AZTEC CULTURES IN AMERICA

• Chia

• Amaranth

• Quinoa
POLYPHENOLS FROM
BY-PRODUCTS OF GRAINS
INDUSTRIALIZATION AND
THEIR USE IN FUNCTIONAL
DRINKS
DEVELOPMENTS CARRIED OUT ON SOY

PRODUCTION OF SOY PROTEIN ISOLATES WITH DIFFERENT TECHNOLOGICAL PROPERTIES
DEVELOPMENTS CARRIED OUT ON SOY

- Effect of slurry preparation methods on the rheological and gelling behavior of soy protein
- Effect of solutes on the hydration characteristics of soy protein isolate
- Denaturation of soybean proteins related to functionality and performance in meat systems
DEVELOPMENTS CARRIED OUT ON SOY

- Functional properties of soy proteins as affected by heat treatment during isoelectric precipitation

Obtention of Soybean isolates: Influence of thermal treatment after neutralization on their Functional Properties
THANK YOU
VERY MUCH!!!