

Breeding for Hypoallergenic Peanuts in the EU



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Overview

1. Crop introduction
2. Market in EU
3. Breeding Idea
4. Breeding Goals
5. Stakeholders
6. SWOT Diagram

Peanut / Groundnut (*Arachis hypogea* L.)

Agronomy:

Leguminosae: nitrogen fixing

Allotetraploid

Drought & Salt tolerant

Mechanized

4 months, may-october

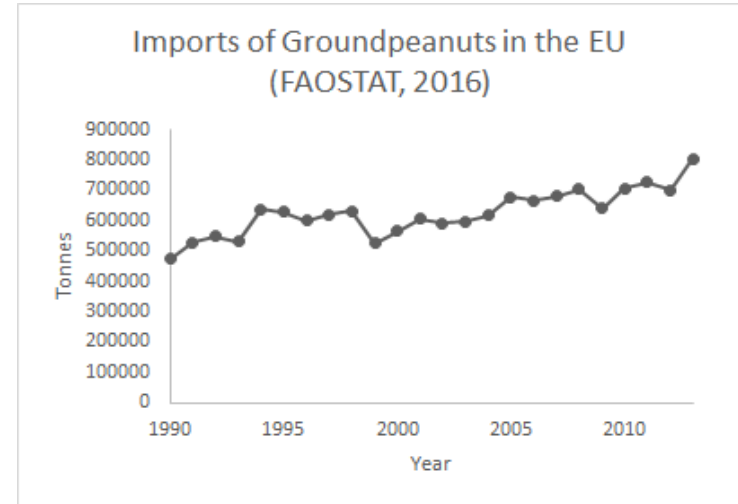


Peanuts in the EU

550.000 T of peanuts consumed in Europe
- 99% imported, Argentina main exporter

Already grown: Spain, Portugal, Bulgaria,
Cyprus

PepsiCo recently introduced varieties to
Spain and Portugal to supply their
production needs.



Less allergic peanuts adapted to mediterranean conditions



Breeding Goals:

Primary Traits:

Hypoallergenicity, Yield, Seed size, Taste

Secondary Traits:

Oil quality, Disease resistance, Blanchability

Evaluation of landraces and currently cultivated varieties

Germplasm banks from public institutions:

COMAV **Spain**

ICRISAT **India**

USDA **USA**

EMBRAPA **Brazil**

INTA **Argentina**



1

RUNNER

*attractive,
uniform kernel*



2

VIRGINIA

*the largest
of all peanut
varieties*



3

SPANISH

*small, with
red-brown skin*

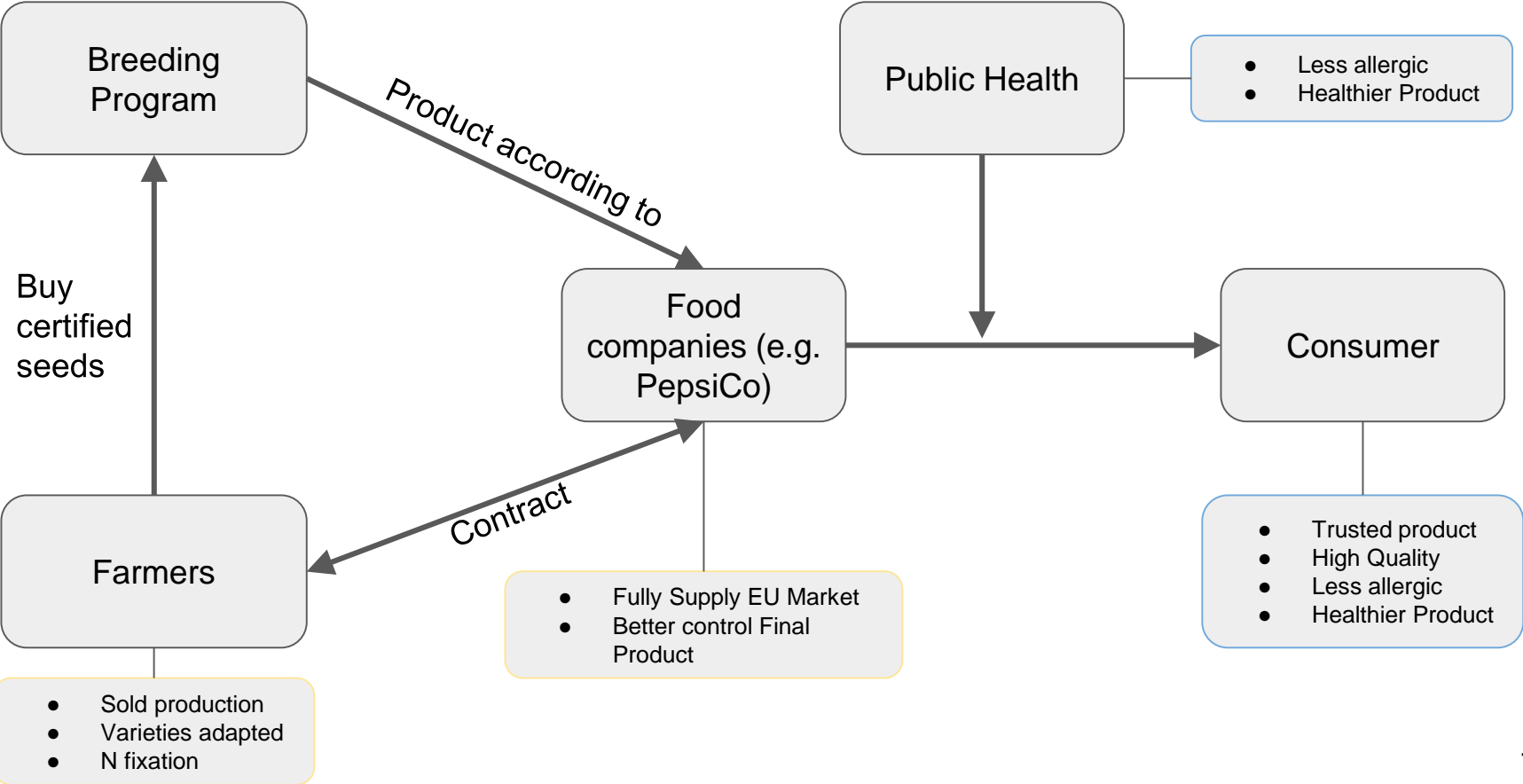


4

VALENCIA

*three or more
small kernels with
bright red skin*

Stakeholders



Allergenicity in Peanut

Affects 1-2% world's population

Commonest fatal food-related allergic reactions

Allergy rate doubled over a 5-year period in Europe

13 peanut allergens (Ara h 1 - Ara h 13) - 15-20% of the total seed protein.

Ara h1 affects more than 90% of peanut-sensitive individuals

Techniques:

Tilling

Crispr-cas

Taste Quantity (Fat)

Peanut (1 oz.)	Saturated Fat	Monounsaturated Fat	Polyunsaturated Fat	Total Fat
Raw Peanut	1.9 g	6.9 g	4.4 g	14 g
Dry Roasted, Salted Peanuts	2.0 g	7.0 g	4.5 g	14.1 g
Oil-Roasted, Salted Peanuts	2.5 g	7.4 g	4.3 g	14.9 g
Peanut Butter, smooth style, with salt (2tbsp.)	3.3 g	7.6 g	4.4 g	16.1 g

USDA, 2009

- Treated peanut's saturated fat is higher than raw peanuts.
- Saturated fat acids are very low.

Blanchability (Skin removed from kernel by heating followed by abrasion)

- Blanchability is under strong genetic control.
- The genetic control and breeding potential for the blanching trait in order to better select parents for the breeding of improved blanchability .
- Early generation selection - Blanched %
- Shokraii et al. (1985) referred to a 36-kD polypeptide related to blanchability in peanuts. It is probable that the same polypeptide is identified as the 38-kD band in Bianchi-Hall et al. (1994) study.

Strengths

Germplasm adapted to Mediterranean Cond.
Easy access to Public germplasms
Breeding in the production region

Weaknesses

New in this crop (Practical knowledge)
No starting funds

Opportunities

European production is rising
Not yet hypoallergenic varieties in the market
European consumers are receptive to hypoallergenic and healthy products
No european peanut breeding companies
Already existing Interest/ Market
Aflatoxins lower with EU farm management
Secure - Food chain supply

Threats

Public foreign competitors (USDA, China, India, Brazil, Argentina)
Aranex Biotech
Cost of production in Europe

Thank you for your attention

