

Bringing Proteins to the market : The case of alfalfa concentrated extracts

Focus on Luzixine, the LRDfood grade specialty

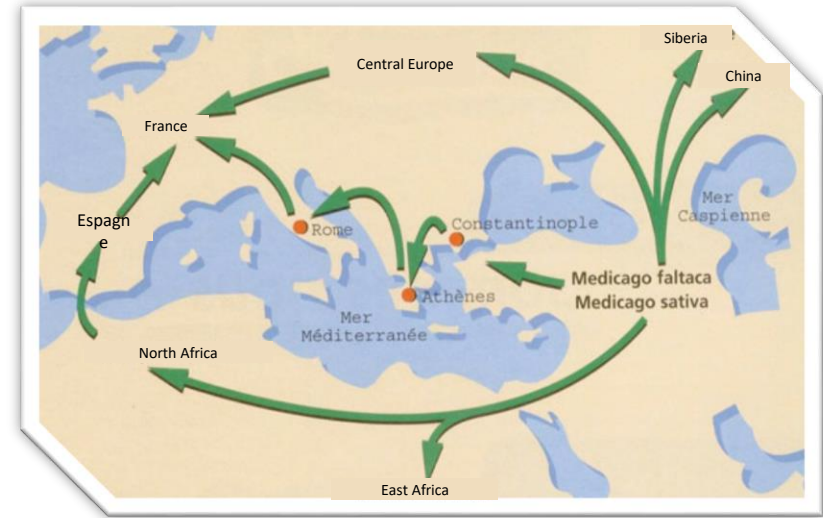
Alfalfa : an ancestral nutritional crop



Common Name : Alfalfa, Lucerne

Plant denomination : *Medicago Sativa L.*

Family : Fabaceae - Pulses



10 000 years of nutritional benefits

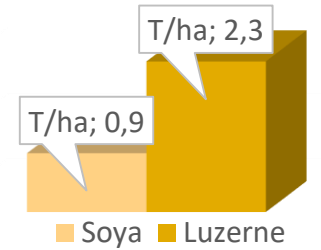
History of use :

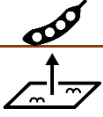
- Domesticated over 9000 years ago on the high plains of Caucasion, in Iran and in Turkey.

Ethymology :

- « Alfalfa », borrowed from the Arabic meaning « **father of all foodstuffs** » due to its **nutritional richness**

Alfalfa: a symbol of sustainable agriculture



- **Highest protein per hectare** 
- **Use of the whole plant** by using co-products
- **Almost no phytosanitary treatment: enriches the soil with nitrogen**
- **Prevention of soil erosion** thanks to its root system
- **Placement without tillage**
- **Purifying plant**
- **Protects biodiversity**
→ Alfalfa cultivation contains a very rich microfauna and macrofauna that can be up to 100 times higher than wheat ⁽¹⁾

A MAGIC PLANT TO MEET TOMORROW'S PROTEIN DEMAND

(1) 2010: "Study on the enhancement of biodiversity on alfalfa - Measurement of differentiated crop management", COOP de France Déshydratation, Muséum National d'Histoire Naturelle

The alfalfa industry: french situation



6th rank
Dehydrated alfalfa

	Surfaces (en hectares)	Production (en million de t)	Nombre d'unités industrielles
USA	7 500 000	55	
Argentine	4 000 000		
Canada	3 700 000		
Chine	264 000	1,5	401
Espagne	141 000	1,4	72
France	65 000	0,83	29
Italie	80 000	0,71	30
Allemagne		0,25	38

Sources: CIDE/USDA/Statistique Canada/China Grassland Association.

The French alfalfa drying industry: keys figures



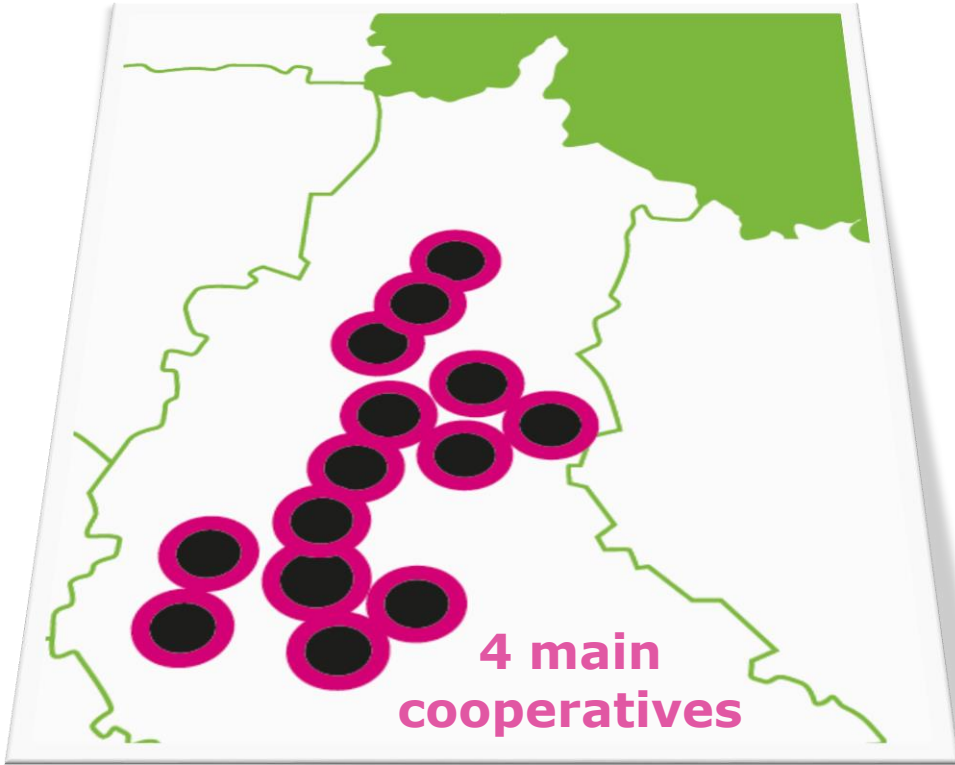
Localization dehydration units



The French alfalfa drying industry: keys figures

82 % Hectares* (figure 2018) in France are upgraded by 4 main regional alfalfa dehydration cooperatives located in « Grand Est area »

Localization dehydration units



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2 commercial companies, 2 expertises



Dehydration Cooperatives



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Market entry – Commercialization of the Luzixine on **human nutrition market**



Leading company on the market of dehydrated products intended for **animal nutrition**

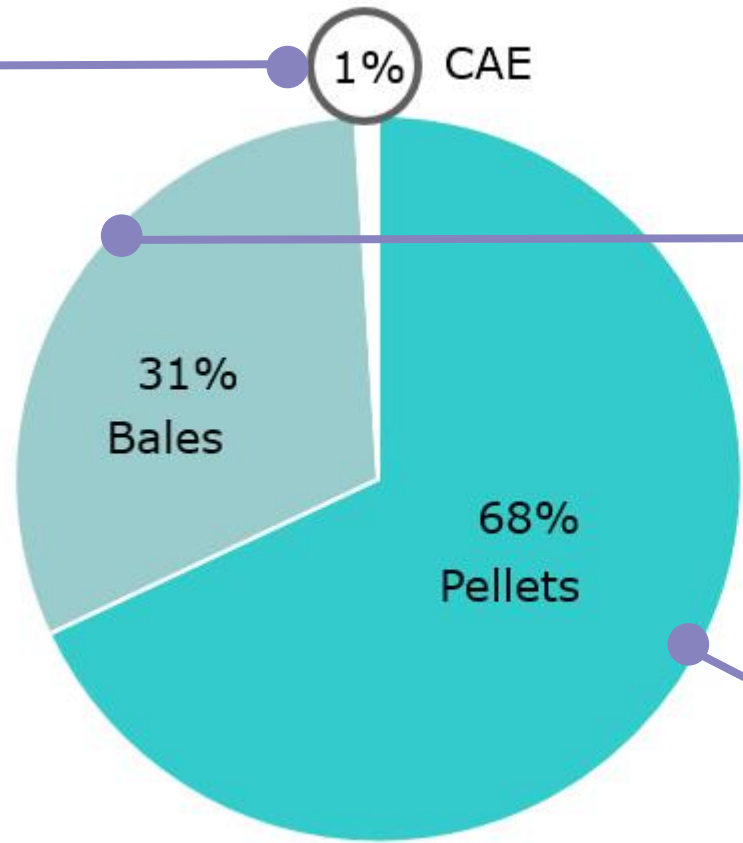


Alfalfa outlets: product distribution

(sources : Désialis)

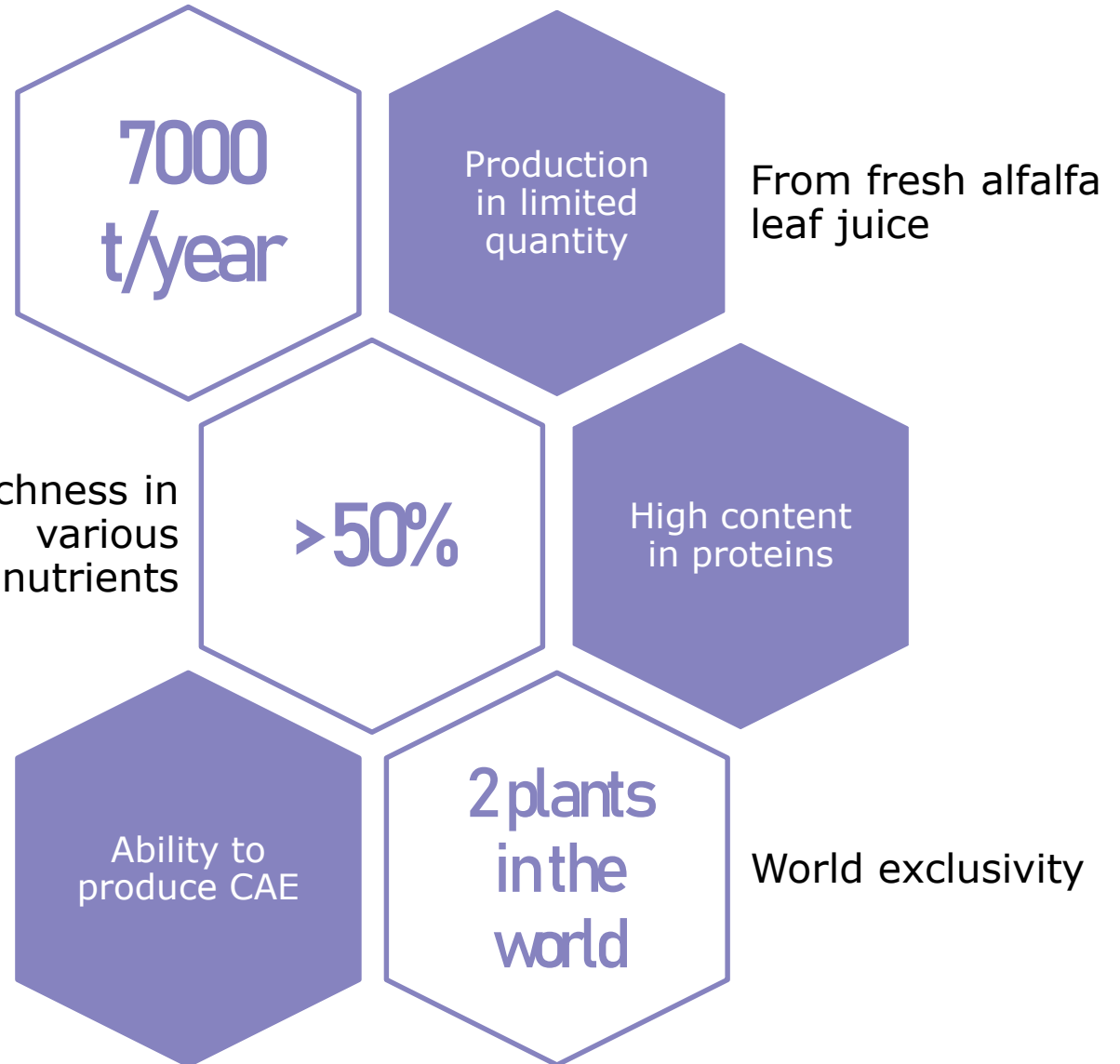


Specialty from alfalfa juice
1% of the global market (feed + food)



2018 figures

CAE: main keys figures



Development origin of CAE, LRD and food applications

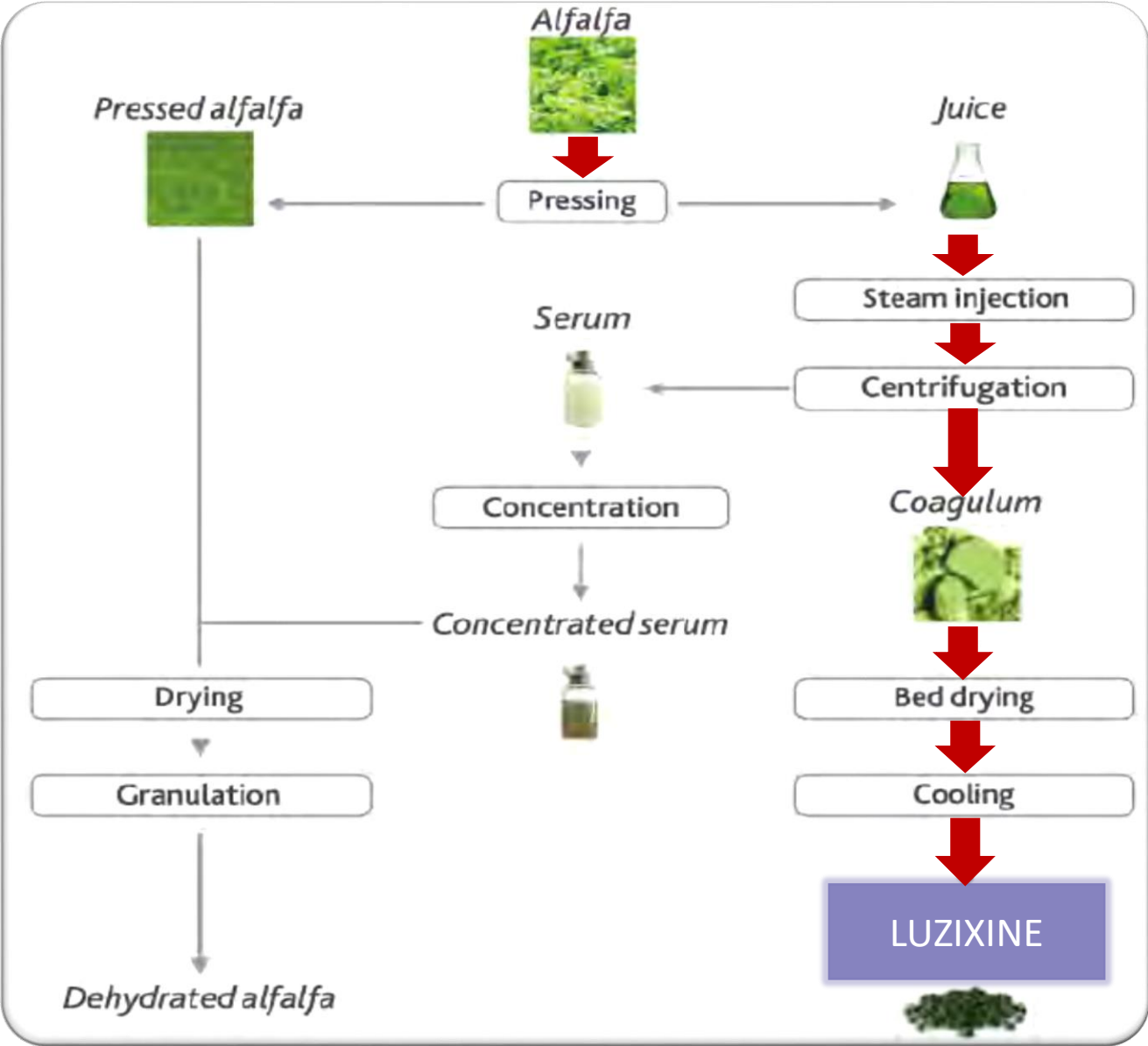
- **Development of the process of leaf fractionation in the 1970s by will:**
 - **To diversify the products** in order to conquer specific markets with higher added value
 - **Save energy**
- **Creation of L-RD (Luzerne - Research and Development) in 2005:**
 - to set up a common research structure in order **to ensure the development of new products and the diversification of their outlets into future markets**



- **Development of alfalfa food applications is based on the industry's willingness to:**
 - respond to **environmental issues**
 - respond to **societal issues**

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The food grade process



Minimum eco-responsible process that concentrates the plant's nutrients



Process and ingredient **approved by the EC in 2009** after 4 years of development

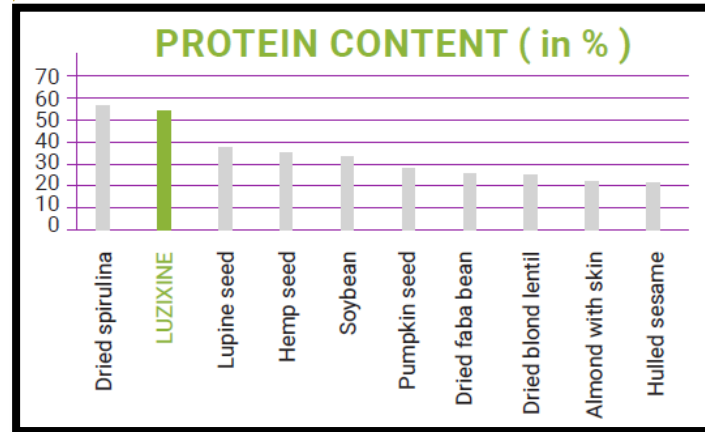
Contains

Vegetable proteins with high biological value:
-Richness in **proteins**

Vitamins including
-Source of **vitamin B6, E, K**
-Richness in **beta-carotene**, precursor of Vitamin A

Minerals including
-Richness in **bioavailable iron**
-Richness in **calcium**

Fatty acids including
- **Excellent ratio $\omega 6 / \omega 3$** rebalancing the ratio in favor of $\omega 3$ s.



- **Chemical score = 108**
- **Good protein digestibility between 70 and 85 %**
- **PDCAAS between 0,8 and 0,9**

NUTRITIONAL CONTENT

NUTRIENT	FOR 10G OF LUZIXINE*	% OF RDA
Proteins	5 - 6 g	-
Omega 3	350 mg	17,5 %
Vitamin A	917 ER	115 %
Vitamin E	2,4 mg	20 %
Vitamin K1	41 mcg	55 %
Vitamin B8	7,9 mcg	15,8 %
Vitamin B9	69 mcg	34,5 %
Calcium	257 mg	32,1 %
Iron	6,5 mg	46,4 %
Lutein	8 mg	-

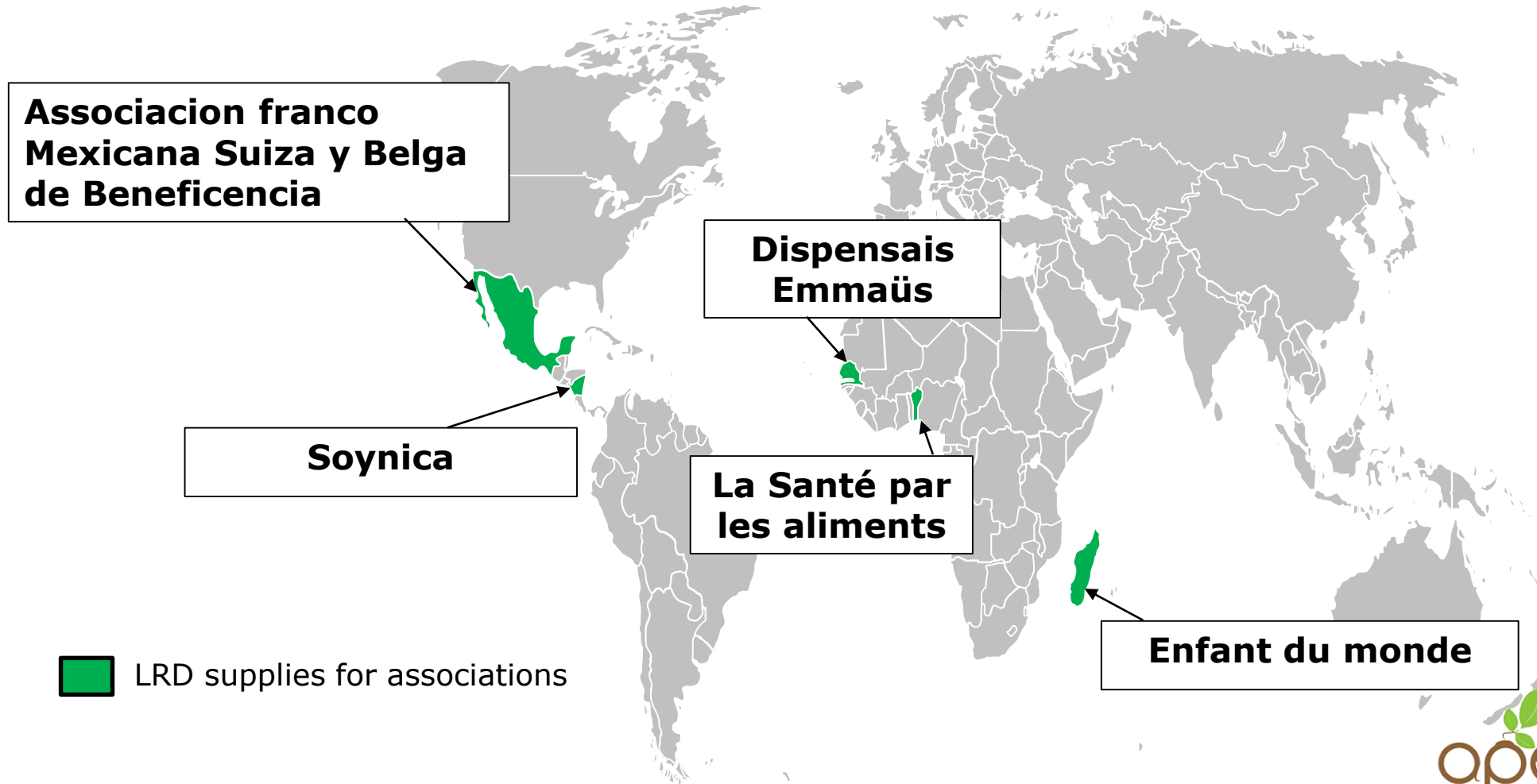
* Recommended daily dose

LRD

A successful development on our historical market : 30 years of proven benefits on malnourish populations

LRD and APEF

- 30 years of supply of concentrated extract in countries that cannot produce or cannot produce enough by themselves
- 25 T/yr sold
- 2 500 000 of 10g dosis distributed



30 years of proven benefits on malnourish populations

Clinical trials have been conducted and have confirmed the benefits and harmlessness of alfalfa protein concentrate.



The observational data from the field shows an improvement in the subjects' nutritional condition with LUZIXINE :

Correction of anemia due to iron deficiencies

Acceleration of height and weight growth in children and teenagers

Decrease in respiratory infections and chronic diarrhea.

Clinical trials sources :

- 1- A nutritional trial evaluating the efficacy and tolerance of using alfalfa leaf extract as a dietary supplement in malnourished children. Study conducted in Peru by Professor Eric Bertin over 12 months from March 2004 to March 2005. *(study available only in French language, title translated from French)*
- 2- Lucerne leaf concentrate, a possible food supplement for the prevention of chronic malnutrition in children. Anonymous. Etude menée au Pérou.
- 3- Leaf concentrate as an alternative to iron and folic acid supplements for anemic adolescent girls: a randomized controlled trial in India. Swati Vyas and al. Public Health Nutrition 2009: page 1 à 6.
- 4- A nutritional trial evaluating the efficacy and tolerance of using alfalfa leaf extract as a dietary supplement in chronically malnourished children. Study conducted in Congo by Professor Eric Bertin over 84 days from November 2004 to February 2005. *(study available only in French language, title translated from French)*

Development of various applications

- Humanitarian:

- Asociacion franco mexicana suiza y belga de beneficencia i.a.p : range



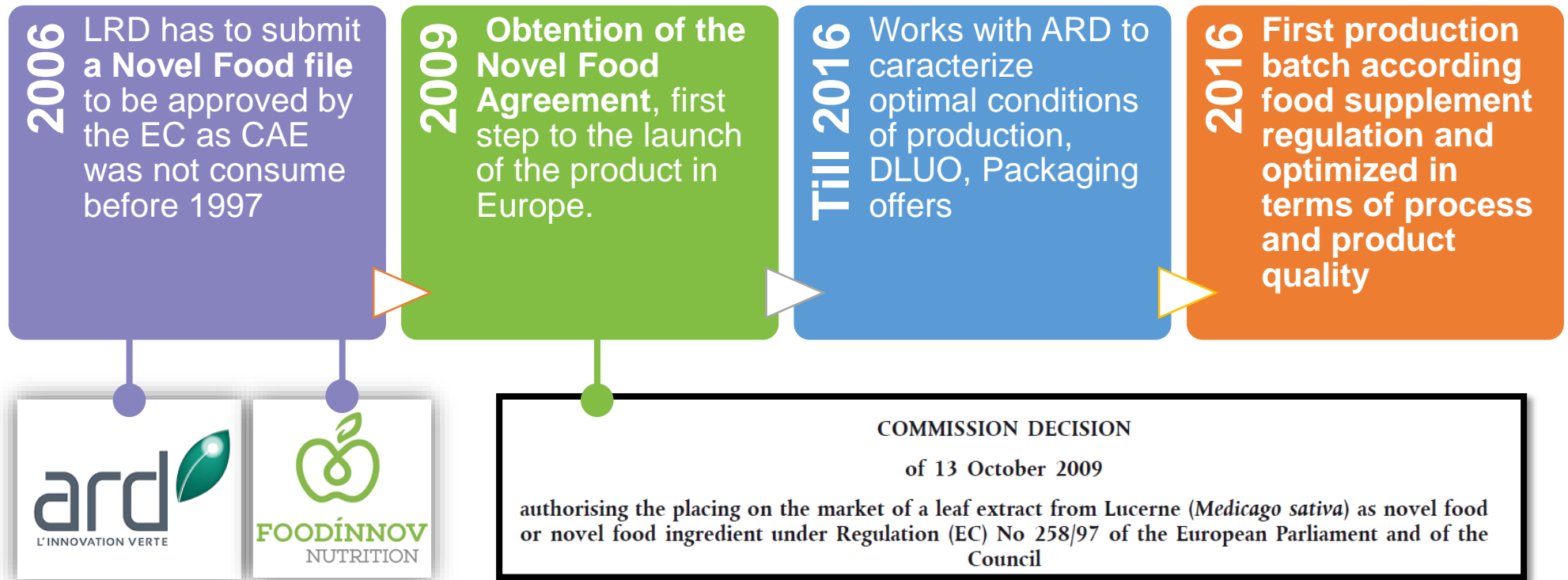
- Soynica



The trust to go further: willingness to supply all consumers

- **A long process before the launch on the european market**

2000's: Alfalfa has proved its worth in developing countries but is **still unknown and under-exploited in developed countries for mass consumption**, while it can serve to **rebalance the contributions in developed countries often too rich in energy and to complement the contributions of populations with specific needs**



Creation of the brand Luzixine

2014: Registration of the brand name Luzixine® for the LRD Food CAE



French production
Gathered into **cooperatives organization**, the french alfalfa drying industry offer a **traceability 100% guarantee**

An **eco-responsible manufacturing process** according to the concept of total exploitation of the plant through the **valorisation of co-products**



Being visible on its market

- 2 years of Vitafoods Europe participation

Understand the customer needs, and adjust its positioning





A support for demanding nutritional needs

FOR NUTRITIONAL FORMULATION OF FOOD SUPPLEMENTS AND SUPERFOODS



VEGANS/VEGE
FLEXITARIANS



- Proteins
- Omega 3
- Calcium
- Iron
- Vitamin K

ELDERLY



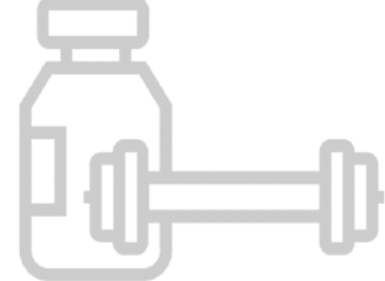
- Proteins
- Omega 3
- Calcium
- Vitamin K
- Lutein and vitamin A

PREGNANT WOMEN



- Vitamin B9 (Folates)
- Calcium
- Iron
- Vitamin K

ATHLETES



- Proteins
- Vitamin B9 (Folates)
- Vitamin E
- Vitamin K
- Iron

Two outlets: food supplements and superfoods



- Example of positioning

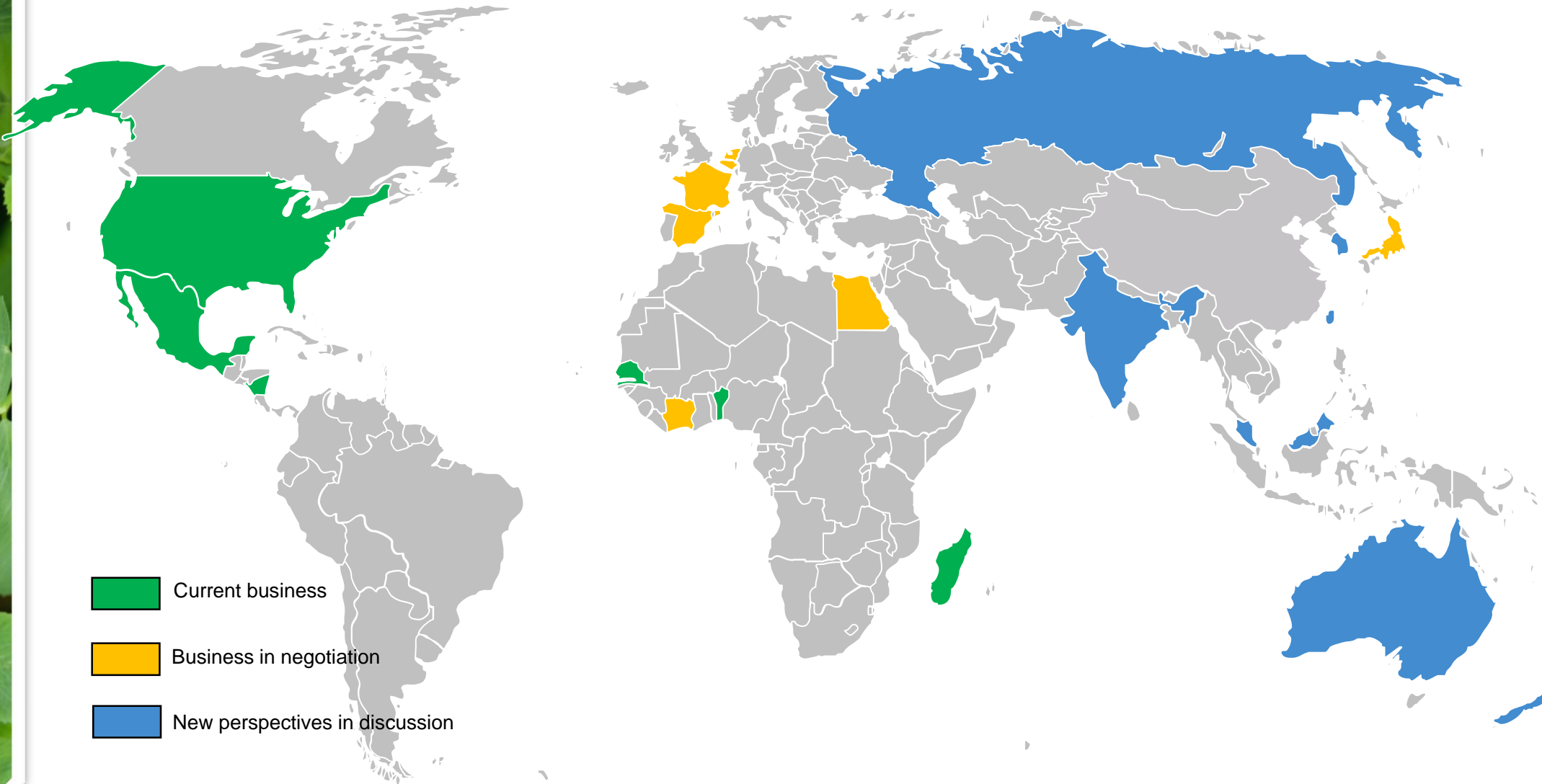





-Capsules for nail and hair vitality



-Grinded into fine powder by one of our distributor to sell as ingredient for bulks, energy and sport bars, diet food, smoothies...

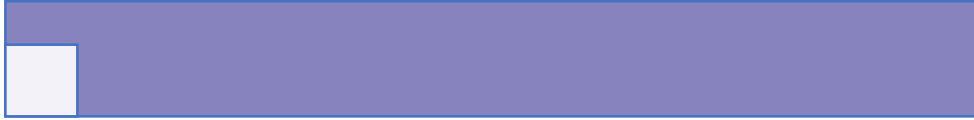
Current business situation and negotiations in 2019



-  Current business
-  Business in negotiation
-  New perspectives in discussion

Next steps

To go further in the development



- Extension of use Novel Food to satisfy future european protein demand
- Communication campaign on the product
- Adaptation of factories for bigger production volumes

Mains difficulties



- Evolution of the regulation of food supplements that get stricter and stricter
- Important investments
- Regulation of countries worldwide : long and costly process of registration





56
INGRÉDIENTS
SOLUTIONS

Process alimentaire – June 2018

NUTRACEUTIQUE

Luzerne, la nouvelle source de protéines durables

La recherche de protéines végétales alternatives bat son plein. Luzerne - Recherche Développement met en avant son extrait qui combine intérêt nutritionnel et écologique.

Dans un monde en pleine transition alimentaire, la diversité des sources de protéines est au cœur des préoccupations. Présent sur un stand pour la première fois au Vitafoods, Luzerne - Recherche Développement (L-RD) a



50%

Luzixine contient 50 à 60% de protéines dont 46% d'acides aminés essentiels.

- The last issue remain the regulation to extend the commercialization in Europe on the food ingredient market for mass consumption.

- Whatever the remaining obstacles to go through, **the french alfalfa drying industry is now ready to face tomorrow challenges** being able to provide quality alfalfa proteins but also vitamins, minerals and $\omega 3$ to human beings in a sustainable way.

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THANK YOU FOR YOUR ATTENTION



Interested?

We are looking for distributors

Any questions?

Feel free to contact me

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LUZIXINE

ALFALFA LEAF EXTRACT (MEDICAGO SATIVA)

NOVEL FOOD APPROVED

VEGAN

MADE IN FRANCE

GMO FREE

GLUTEN FREE

DAIRY FREE

AUTHORIZED HEALTH CLAIMS FOR 10G OF LUZIXINE

- RICH IN PROTEINS**
 - Muscle growth
 - Maintenance of normal bones
 - Bone growth in children
- RICH IN IRON**
 - Formation of red blood cells
 - Cognitive functions
 - Fatigue reduction
- RICH IN CALCIUM**
 - Bone & teeth
 - Enhance the loss of bone mineral in post-menopausal women
 - Growth and development of bone in children
- SOURCE OF VITAMIN E**
 - Cell protection against oxidative stress
- RICH IN VITAMIN A**
 - Immunity
 - Vision
 - Cell Specialisation
- RICH IN VITAMIN B9**
 - Fetal tissue growth during pregnancy
 - Cell division
 - Fatigue reduction
- RICH IN VITAMIN K1**
 - Maintenance of normal bones
- SOURCE OF OMEGA 3**
 - Cholesterol reduction
 - Child normal growth and development

LEGEND: children, Senior, Sportsmen, Vegan, Pregnant women

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Valentine CLAUDON

Development Manager

Mobile: +33 7 88 76 26 30

E-mail: valentine.claudon@luzerne-rd.fr

LRD - Complexe Agricole du Mont Bernard
Route de Suippes
BP149 - 51008 Châlons en Champagne



www.luzixine.fr