



A revolutionary food supplement to fight malnutrition

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Over 2 billion people suffer from chronic malnutrition caused by dietary deficiencies in proteins, vitamins, trace elements and minerals, in particular vitamin A and iron

It is the leading cause of excess mortality, due to an individual's greater vulnerability to infectious diseases, and can also bring about severe handicaps: for instance, a deficiency in vitamin A causes permanent blindness in 500,000 children each year

Alfalfa leaf extract (ALE) food supplement is listed on a positive list as safe for the intended use by the US Food and Drug Administration (Title 21 – revised April 1, 2001). In addition, it can be produced in a very cost effective way, i.e. \$3. per year for a child

After more than 10 years of research and development, ALE has a proven track record in combating malnutrition. Investment in local production is required to build manufacturing plants in areas affected by malnutrition in order to reach all sufferers, especially children

Scientific development and proven benefits to combat malnutrition

It was in 1975 in France that ALE was first discovered as having a nutritional composition fit for human consumption. In 1993 the *Association for the Promotion of Leaf Extracts in Nutrition* (APEF) was set up to validate the process of using chloroplast leaf extracts as nutritional supplements to combat chronic malnutrition. Cooperation with scientists from Reims University made it possible to conduct rigorous studies relating to the effectiveness and safety of ALE. Today APEF is present in more than 20 countries with more than 40 million daily doses already distributed i.e. 320 tons of extract in Africa and Latin America.

Innovation Towards Sustainable Development

Member of IUCN, The World Conservation Union

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The organization of the Knights of Malta has supported this food supplement program and rigorously monitored the NGOs which distributed the extracts. Medical reports from local experts are unanimous in noting the fast improvement in health of the relevant individuals:

- Pregnant or nursing mothers and children after weaning;
- People suffering from malnutrition, even severely (of which kwashiorkor and stagnation);
- Patients with AIDS, malaria, leukaemia or tuberculosis;
- Elderly people.

The recommended doses are 5 to 10 gr per day for children and 10 to 15 gr per day for adults (annual cost being on average \$6 per person per year), it gives the following effects:

For mothers

- Higher birth-weight for their children;
- An increased quantity of breast milk.

For children

- Easing of the delicate period of weaning;
- Appetite returns, weight increases;
- Speeding up of growth;
- Reduction and rapid disappearance of diarrhoea;
- Effectiveness against marasmus and kwashiorkor;
- Better response to education.

Generally

- Regression or elimination of anaemia in 3 months in more than 70% of cases;
- Diminished incidence and duration of ailments associated with malnutrition (infections of the upper respiratory system, the skin and eyes);
- Rapid improvement in several aspects of the blood picture, especially in the levels of haemoglobin (Iron) and of retinol (Vitamin A);
- Better resistance to infections, e.g. Noma in children;
- Improved general condition in cases of serious infections: tuberculosis, AIDS, etc.

A large-scale distribution-observation has been conducted by Sister Luci in Nicaragua over the last 12 years (see attached a summary of one of her recent conferences in Brussels), it shows the exceptional efficacy of ALE.

The nutritional content of alfalfa leaf extract is exceptional

Foods	Protein	Vitamin	Folic Acid	Vitamin	Iron	Calcium	Magnesium	Copper	Zinc	Moisture
per 100 g	g	A mg	mg	E mg	mg	mg	mg	mg	mg	%
Alfalfa extract	51,00	55,00	0,30	30,0	60,0	3 140	118	0,78	1,26	8
Beef	17,0	0,02	0,02	0,3	3,0	10	20	0,05	1,50	57
Chicken	21,0				1,0	14	19	0,35		73
Whiting	17,0				0,9	45	30	0,10	0,74	70
Millet	11,0			1,2	4,0	30	167	0,30	1,70	10
Brown rice	8,0				1,0	50	106	0,40	0,40	13
Dry beans	19,0		0,05		6,7	137	150	0,90	5,20	8
Wheat flour	9,5			1,0	1,2	16	20	0,20	1,70	13
Whole milk	3,5	0,03		0,1	0,1	130	14	0,07	0,75	87
Yoghurt	3,5				0,3	174	14	0,10	0,90	87
Eggs	14,0	0,30		1,0	2,8	55	11	0,16	1,50	74
Spinach	2,3	3,00	0,90		4,0	81	50	0,90	5,20	92

RELATIVE TO OTHER FOODS (average contents per 100 g)

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Alfa-linolenic acid concentration (Omega 3) is on average 3,6%, regarding linoleic acid (Omega 6) the concentration is reaching 1,4%.

Scientific validation and toxicological data

Prof. Eric Bertin, coordinator of the scientific commission of the Reims Hospital, has conducted a program of seven studies since 2004 in Peru, RDC and India. Two studies have been completed which confirmed the above observations; in both cases no negative effect was noted. The US Food and Drugs Administration (Title 21 – revised April 1, 2001) lists alfalfa as safe for the intended use.

Funding requirements

France is currently the only country with the technology and infrastructure required to produce ALE on an industrial scale.

Pro-Natura International, a leading NGO in the field of third world rural development, is working in partnership with the Knights of Malta France to develop the consumption of ALE in Countries most affected by malnutrition.

The cost of a distribution programme is of \$1.5 per kg.

Scientific Council of the project

Co-ordinator	Pr. Eric BERTIN	Nutrition (ebertin@chu-reims.fr)
Members	Pr. Michel ABELY	Pediatrics
	Pr. François-Xavier MAQUART	Biochemistry - doyen de la Faculty
	Pr. Hervé MILLART	Pharmacology
	Pr. Claudie MADOULET	Biochemistry & molecular biology

Personalities in science and medicine in an advising role

Prof. John Waterlow, Past Head of department of Nutrition, London School of Hygiene and Tropical Medicine

Prof. Jacques Belleville, Chief Nutritionist – Unit of Cellular & Metabolic Nutrition, University of Dijon

Prof. Philippe Bouchet, Botanic Laboratory – Faculty of Pharmacy of Reims

Prof. Henri Choisy, Past Director of the Laboratory of Pharmaco-Toxicology, University of Reims

Prof. Jean-Claude Dillon, Past Professor of Nutrition at the National Institute of Agronomy Paris- Grignon

Prof. Jean-Claude Etienne, Senator of Marne

Prof. Daniel Lemonnier, Nutritionist – Founder of GERM (Group for Research on Malnutrition)

Prof. Marc Leutenegger, Past Head of Diabetology-Nutrition, University of Reims

Prof. Donald Mc Laren Institute of Ophthalmology of London, Editor of “Xerophthalmia Club Bulletin” and “Sight and Life”

Prof. Jean-Louis Tisserand, Faculty of Agronomy of Dijon

Scientific studies relating to ALE

Peru 1 - completed – report available.

Controlled study during 12 months testing the effectiveness and safety of ALE in 30 children versus milk powder.

Identical result to milk powder for the increase in height and weight and stigmata of protein malnutrition. Complete disappearance of lack of iron anaemia with ALE. Professor Eric Bertin, University de Reims and the medical team of Huaycan: Adriana Cordero and Doctor José Villareal.

India, Jaipur - completed – report available.

Controlled study of haemoglobinemia in 60 young women suffering from anaemia receiving 5 mg of iron via 10 gr of ALE during 150 days versus tablets containing 60 mg of iron sulphate. Iron ratio: 1 to 12.

Equivalent effects of ALE on the correction of anaemia and on the evolution of average haemoglobinemia.

Professor Beena Mathur, University of Rajasthan in collaboration with Professor Eric Bertin.

Congo-Kinshasa - completed, results under analysis.

Observation of the proteinemia in 20 young children during 3 months versus milk powder.

Professor Kodondi, University de Kinshasa en collaboration avec le Professor Eric Bertin.

Peru 2 - completed, results under analysis.

Study controlled during 6 months of ALE in 70 children versus milk powder.

Publication will be coupled with study Peru 1.

Professor Eric Bertin, University of Reims and the medical team of Huaycan: Adriana Cordero and doctor José Villareal.

Togo – programmed.

Study of the impact of EFL consumption during 12 months among an important village population (300 persons) versus milk powder.

Observation of the acceptability of consumption among different age groups and public health criteria together with the impact of the frequency and evolution of diseases and mortality.

Professor Eric Bertin in collaboration with Professors Georges Hazebroucq and Bruno Lucien from the Order of Malta.

Countries where ALE are being used

ALE are being used in 23 countries:

- Latin America: Nicaragua, Mexico, Panama, Equator, Peru, Bolivia, Haïti;
- Africa: Senegal, Mauritania, Mali, Burkina, Guinea, Togo, Benin, Cameroon, Niger, Congo, DRC, Rwanda, Burundi, Madagascar, Egypt;
- India.