



Effects of *pinus radiata* pine seed oil consumption on Evidence of a new functional alimentary for the control of diabetes

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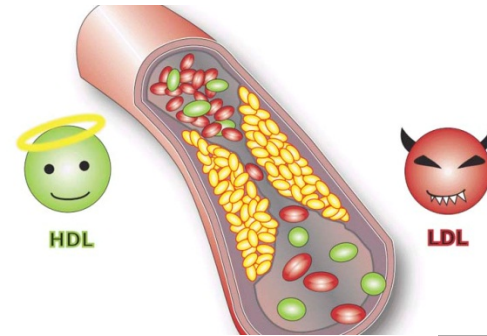
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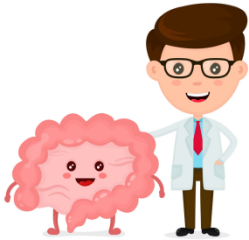
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¿Have you hear about the metabolic syndrome?

Heart



Intestine



Circulatory



Pancreas



Stomach



Liver

Skin disorders

¿Do you know how many people
have it only in Chile?

It affects **32%** of the Chilean
inhabitants older than 17 years.

That is to say, almost **4**
million people suffer
from it!

Source: La Tercera, 2017



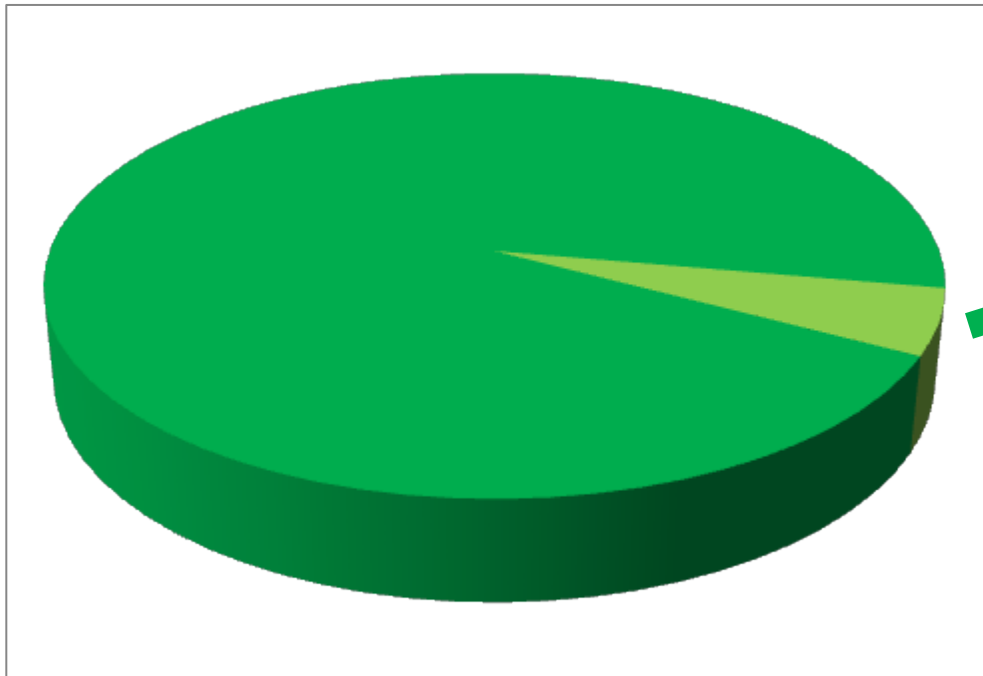
¿How much annually spend a person with metabolic syndrome?

The average annual cost is **2.100 USD/person** and increases by **24%** for each risk factor

Source: Boudreau et al, 2009.



¿How much does a person consume in natural and / or complementary alternatives?



7% captive market looking for new alternatives!



Source: Laboratorios Knop, 2017.

**Bringing all of the
above to market
numbers in Chile**

**112 MUSD of
captive market**

15,7 MUSD in oils
(alimentary supplements)

**But the most impressive is that it is
estimated a growth of 15.3% in value
and 3.8% in volume for the next few
years!**

Source: IMS Health, 2017.
UM Comtrade, 2018



¿What alternatives are there to solve this problem?

There are plants and seeds that contain natural chemical compounds that are beneficial for health



Chia



Nuts



Almonds

They contain chain polyunsaturated fatty acids > C14

¿What about the pine nuts?. That little products...



¿Pine nuts?

- ✓ Pines and other pinaceae, species of the pinaceae family, are classified within conifers that produce pine nuts contained in cone-shaped structures called strobilus, pineapples or cones.
- ✓ Worldwide there are about 30 species of pine that produce edible pine nuts, but only some have commercial relevance.
- ✓ The most important being *Pinus gerardiana*, which produces the so called Pakistani or Indian pine nut; *Pinus koraiensis*, the Chinese pine nut; *Pinus sibirica*, the Russian pine nut; and *Pinus pinea*, the Mediterranean pine nut.
- ✓ The rest of the edible pine nuts are relevant mainly at the local level, where they are in general a traditional food particularly used by aboriginal cultures or "First Nations" (GRAS-FDA, 2010).

Brief Technical State of art

- ✓ The pine nuts, in comparison to other fruits or seeds, corresponds essentially to the significantly higher presence of C18 and C20 polyunsaturated fatty acid with unsaturations positioned in the form of omega-3, omega-4 and omega-6.
- ✓ Specifically, in this type of plant sources, a high content of linolenic acid, pinolenic acid (PNLA), taxoleic acid and sciadonic acid, among others, is usually found in a unique manner.
- ✓ Of these, one of the most studied corresponds to PNLA representing 14-19% of the total fatty acids present in the pine nuts.
- ✓ The consumption of PNLA has been associated with positive effects in the reduction of inflammation, immune function, appetite and body weight, blood lipids, insulin sensitivity and cancer metastasis (Xie et al 2016).

Brief Commercial State of art



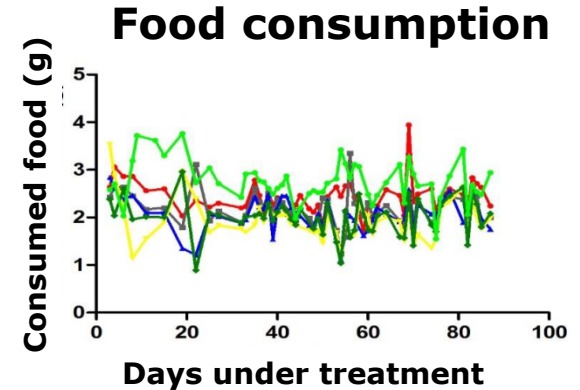
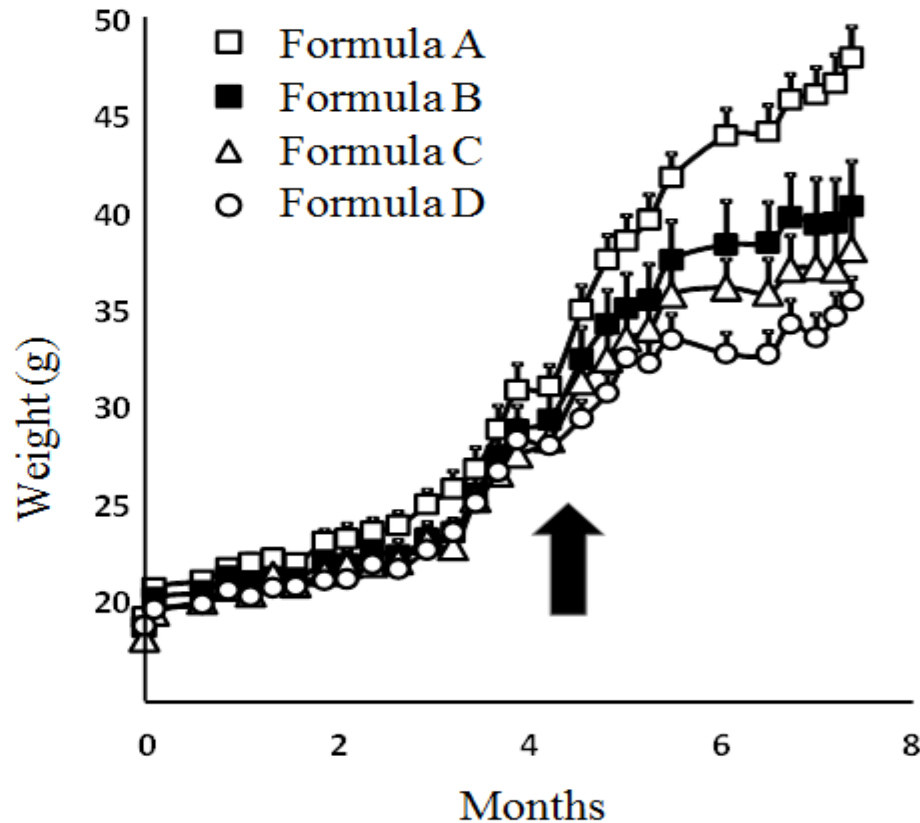
¿What we found with our proposal?

Pine nuts from radiata pine: Pine present in Chile in 1,4 million hectares





We discovered the following in obese mice model (strain C57BL/6)



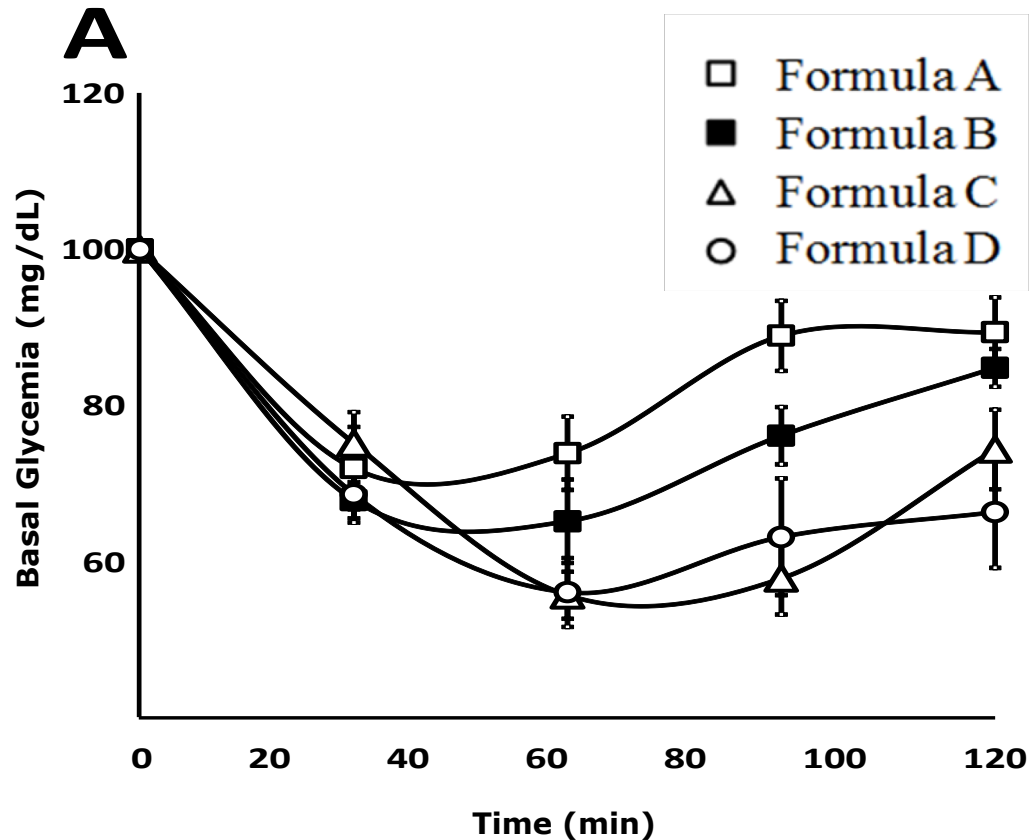
The strange thing is that they ate the same ...

Mice when consuming our oil stopped gaining weight!

Source: Chilean patent. 2015-03182

And the effect was enhanced by mixing it with another kind of oils

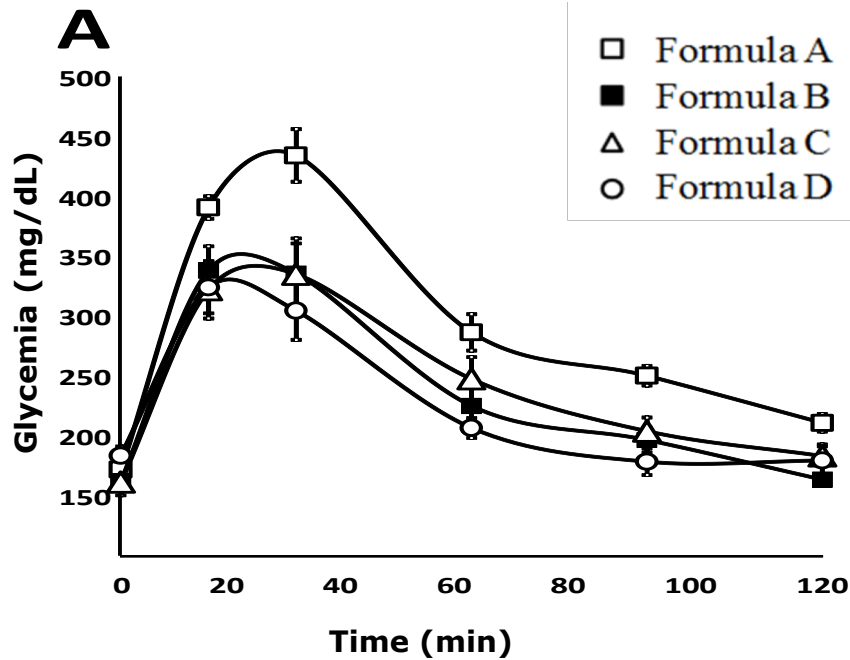
But not only that...



Decreased insulin resistance, that is, caused an insulin sensitization

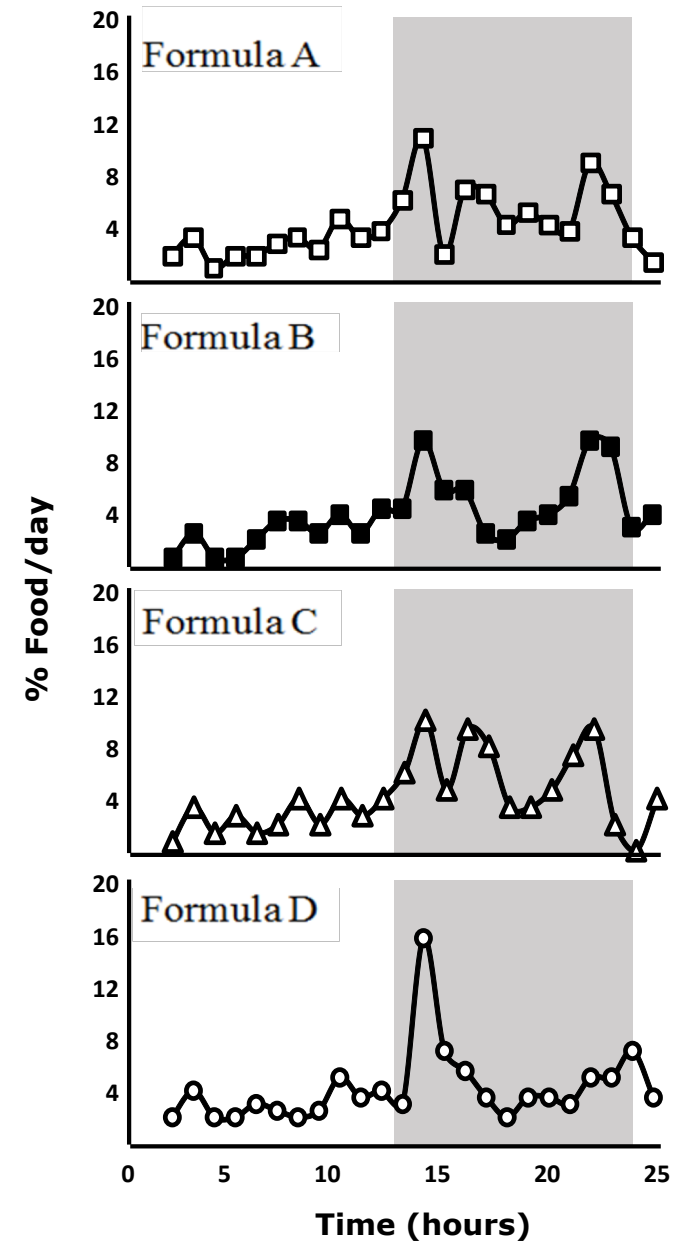
Source: Chilean patent. 2015-03182

And also...



Modulated the appetite, that is, encourages eating in an orderly manner during the day

Source: Chilean patent. 2015-03182





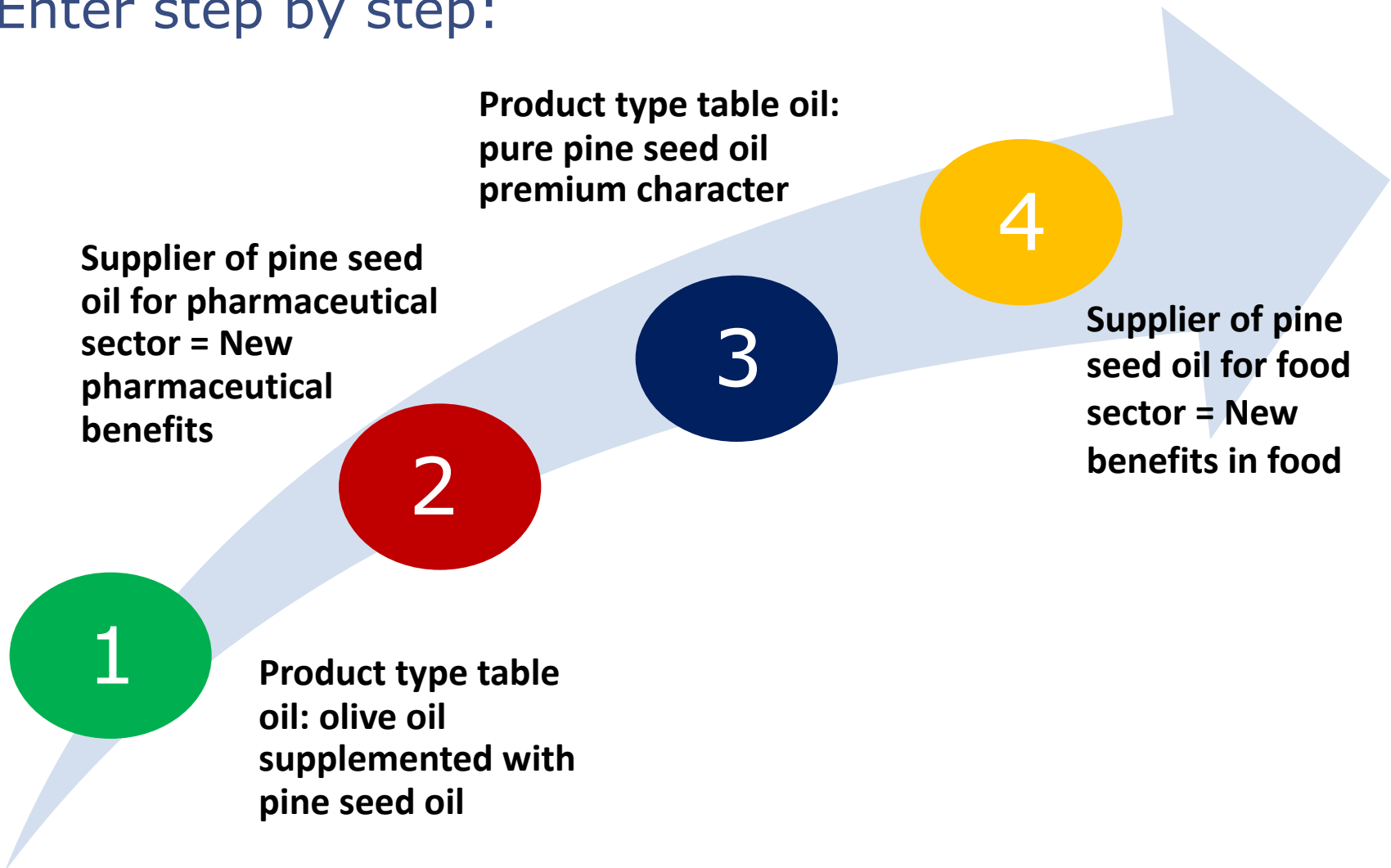
**Therefore, our offer corresponds to
provide a new nutraceutical oil**

This type of oil can go
from 100-140 USD / Liter,
depending on different
market segments



¿What is our idea of market penetration?

Enter step by step:



5 minuts for questions

