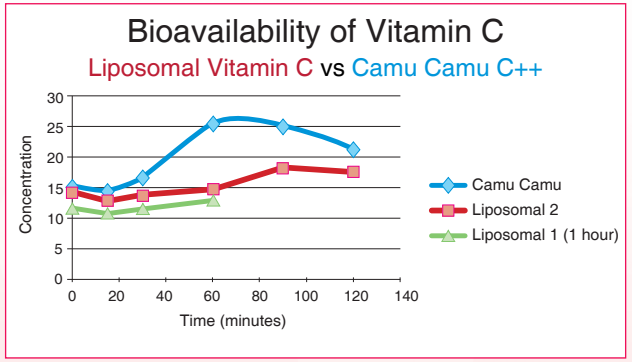
Comparative test of the bioavailability of 2 forms of vitamin C

In this test, the blood level of vitamin C was measured repeatedly for 2h (time t0, t15, t30, t60, t90 and t120), before and after taking 300 mg of vitamin C, either in liposomal form on day 1, or in natural (from Camu Camu) on day 2.
Other measures of liposomal vitamin C have been done for 1 hour (green curve in the graph below).



The results obtained show that the natural vitamin C from Camu Camu is more bioavailable than the liposomal form, unlike to the claims that the manufacturers claim (cf. table above). Indeed, the plasma level of natural vitamin C always remains higher compared to that of liposomal vitamin C for the 2 hours of this test.
On the other hand, this dosage does not make it possible to dose the quantity of intracellular vitamin C, and therefore this information is missing and does not allow conclusion as for the best intracellular assimilation of a or some other form.
However, if the recent discovery of the UCL concerning the mode of assimilation of vitamin B1 can be extrapolated for vitamin C, an increase of the intracellular amount of vitamin C seems not interesting, since the cell itself regulates the amount of vitamin C it can accept and prevent its internalization (via the reduction of the expression of carrier) in case of excess.
Another vitamin C assimilation route, such as might have liposomal vitamin C, could short circuit this natural self-control mechanism of the cell and cause an excess of vitamin C in the cell that could be harmful for it (and for the health) rather than positive.
These results are indicative. They were obtained at from a small sample (1 person, 1 measure of bioavailability of natural vitamin C and 2 measures for liposomal vitamin C), but it would appear that the form of natural vitamin C is well bioavailable in intestinal level and more effectively compared to the improved liposomal vitamin C form of a technological point of view.
Finally, our organism, which usually consume fruits and natural vitamin C for many generations, would it be more better than liposomal technology in this case?

Comparative test bioavailability 2 forms of vitamin C Natural VS Liposomal

Natural Camu Camu

?

VS

Synthetic, Liposomal Vitamin C

Natural or liposomal vitamin C?

Several manufacturers extol the merits of their liposomal vitamin C which would have better bioavailability, i.e. better capacity to reach the blood circulation, while being stable longer in our body compared to natural forms that can be found in fruits.

The winner: nature, our Camu Camu!

In this test, the blood level of vitamin C was measured at several times for 2 hours (time t0, t15, t30, t60, t90 and t120), before and after taking 300 mg of vitamin C, either in liposomal form on day 1, or in the form natural (from Camu Camu) on day 2.
The results obtained show that the natural vitamin C from Camu Camu is currently more bioavailable than the liposomal form.

Current state of knowledge on vitamin C

The bioavailability of natural vitamin C decreases with his concentration. Indeed, the oral intake of 30 mg / day of vitamin C achieves bioavailability 87% while that of 500 mg, bioavailability 63%.

In addition, the maximum plasma level of vitamin C in people deficient in vitamin C is obtained after taking 500 mg of vitamin C (Levine et al.). In other words, taking more than 500 mg of vitamin C doesn't improve your blood level. It would therefore seem that taking more than 500 mg of vitamin C is not interesting for improving the blood level, nor for his health.

A intake of 200 mg of vitamin C per day is sufficient for achieve a plasma vitamin C value of 67 µM (12 mg / L) for which a preventive effect against cardiovascular disease and cancer has been brought up evidence (extract from the book by M. J. Pincemail "Stress oxidant and antioxidant ").

Sleep and vitamin C?

It is said that vitamin C would prevent sleep. However, this would be seen more often in consumers of synthetic vitamin C, to which various other substances have been added such as preservatives, sweeteners, colors, ...! The natural vitamin C on the contrary does not excite and promote good sleep.

Let's remember that liposomal vitamins C contain synthetic vitamin C ...

Vitamin C Claims liposomal

After these few theoretical reminders, let's go around claims regarding liposomal vitamin C, and compare them to natural vitamin C. We will see if these affirmations are verified in our little test later.

Liposomal vitamin C	Camu Camu C++
What is that ?	
Synthetic form of vitamin C, L-ascorbic acid, which is found in liposomes. We are talking about a bioidentical form: synthetic vitamin C identical to the natural form, made from fermentation of cereals. ➔Natural origin, but resulting from various transformations who use chemistry.	Natural form from the whole fruit
Liposoluble vitamin C. This is contained in a vesicle whose structure approximates that of the membranes cells. Hence the hypothesis that it would be larger proportion in the blood. The intracellular assimilation pathway for this vitamin would be different from natural vitamin C, but what about of the natural control mechanism of cells to avoid its harmful intracellular accumulation?	Water-soluble vitamin C. A recent UCL study has highlighted the mechanism of vitamin B1 intracellular assimilation. This one passes the cell membrane via a transporter. The amount of transporters that the cell expresses on its surface is proportional to its need for vitamin B1. Conversely, if the amount of intracellular vitamin B1 is sufficient, it then expresses very little of this carrier in order to avoid a intracellular excess of this vitamin. If this mechanism is similar for vitamin C, a mode of different assimilation, via a liposomal structure, seems unnecessary or even counter the natural self-checking mechanism of the cell.
Bioavailability	
Better bioavailability = The intestinal wall and cells would leave more pass vitamin C ➔ there should be more vitamin C in the blood. This was not observed in our test.	Fruits rich in vitamin C inherently contain bioflavonoids that reduce oxidized vitamin C, and therefore regenerate it. Which results in better bioavailability because it is active longer. In our test, the blood level of natural vitamin C is higher within 2 hours.
Brings vitamin C to the heart of the cells. ➔The vesicle allows to cross cell membranes. Lack of evidence. How is this managed by the cell?	There is probably already a mechanism for transporting natural vitamin C via a membrane transporter (cf. UCL study), but this has yet to be studied.
Slow and continuous release into cells ➔The concentration should remain high in the blood. This was not observed in our test during the 2 hours.	In our test, the blood level of natural vitamin C is higher within 2 hours than liposomal vitamin C.
No degradation by gastric juices. ➔The concentration remains high in the blood.	In our test, the blood level of natural vitamin C is higher within 2 hours than liposomal vitamin C.
Good tolerance: no digestive disorder or acidity.	Good tolerance: no digestive disorder or acidity.
Could more easily diffuse into the brain (lack of proof).	A vitamin C transporter, SVCT2, is present at the surface of the microglia cells of the brain and allows the vitamin C to enter these cells.