

Alfalfa as a food for tortoises, it's all good news.

I have quoted, with references, two reviewed scientific articles/sources for this blog. If you are the kind of reader who will investigate all that 'doing your research' as many say, then you should be able to understand that Alfalfa is indeed a good food source for your tortoise. If you are someone who runs with the popular "don't feed alfalfa" point of view, I'd encourage you to read all this stuff. 'I read it on the internet' – well the internet does not author information, people do. As a student of tortoise nutrition, I read the primary scientific literature and translate it into actionable tortoise husbandry, then you can now be assured, that you read it on the internet. Alfalfa is a good food for your tortoise.

So how much Alfalfa should be part of the diet? Certainly, more than none at all, the common popular wisdom we see so many people spout on about. Many sulcata breeders put full bales (dried) of alfalfa into large outdoor paddocks for their breeding groups to eat at free will (as much as they want). I include about 1 cup of dried crumbled leaves (mostly) and small stems per 15 to 20 heads of fresh lettuces. This is fed to a whole range of species from the spider tortoises of Madagascar to Galapagos giants. Redfoots and other forest species to many Testudo species and leopard tortoises. So - both forest and grassland species.

We all know tortoises need D3 and Alfalfa has it. Not enough to meet all the needs of a tortoise but some is better than none. There is also D2 which with that little bit of sun or artificial UV lighting can become D3. Here is the abstract of the source article on that...

"Vitamin D2 and vitamin D3 were isolated from *Medicago sativa* (alfalfa) grown under field and laboratory conditions and then irradiated with ultraviolet light. The vitamins were identified by ultraviolet absorption, mass spectroscopy, and comparison with synthetic standards on several chromatographic systems. Sun-cured, field-grown alfalfa contained vitamin D2 at a concentration of 48 ng/g (1920 IU/kg) and vitamin D3 at 0.63 ng/g (25 IU/kg). Laboratory-grown alfalfa, artificially irradiated, contained vitamin D2 at a concentration of 80 ng/g and vitamin D3 at 1.0 ng/g. Therefore, the presence of vitamin D2, as well as vitamin D3, has unequivocally been demonstrated in alfalfa plant tissue."

The isolation and identification of vitamin D2 and vitamin D3 from *Medicago sativa* (alfalfa plant)

R.L.Horst, T.A.Reinhardt, J.R.Russell, J.L.Napoli

<https://pubmed.ncbi.nlm.nih.gov/6326678/>

Protein, what about that high protein? Well here is a more extensive list of nutrients in Alfalfa ...

Main analysis	Unit	Avg	SD	Min	Max	Nb
Dry matter	% as fed	90.6	1.3	84.9	96.0	15014
Crude protein	% DM	18.3	2.1	13.1	27.9	14989
Crude fibre	% DM	28.6	3.7	15.7	38.5	13571
NDF	% DM	45.9	4.6	32.3	54.7	1017 *
ADF	% DM	32.7	4.0	22.0	41.5	1020 *
Lignin	% DM	8.5	1.3	5.4	11.8	832 *

<u>Ether extract</u>	% DM	2.7	0.6	1.5	4.4	1089
<u>Ash</u>	% DM	11.7	1.4	8.1	16.8	5848
<u>Starch (polarimetry)</u>	% DM	3.3	0.6	2.1	4.2	60
<u>Total sugars</u>	% DM	4.5	1.2	1.9	6.9	46
<u>Gross energy</u>	MJ/kg DM	18.0	0.4	17.8	19.0	42 *

Minerals	Unit	Avg	SD	Min	Max	Nb
<u>Calcium</u>	g/kg DM	22.1	4.1	11.5	33.6	2224 *
<u>Phosphorus</u>	g/kg DM	2.7	0.4	1.8	3.8	1818
<u>Potassium</u>	g/kg DM	25.6	3.3	17.1	31.7	105
<u>Sodium</u>	g/kg DM	0.2	0.1	0.1	0.5	123
<u>Magnesium</u>	g/kg DM	2.1	0.5	1.5	3.4	176
<u>Manganese</u>	mg/kg DM	32	12	17	60	40
<u>Zinc</u>	mg/kg DM	30	12	18	64	114
<u>Copper</u>	mg/kg DM	6	2	2	11	96
<u>Iron</u>	mg/kg DM	544	274	223	1084	29

This table is from <https://www.feedipedia.org/node/275>

You will notice that Alfalfa has a reported ‘crude’ protein of 18.3%. So, what does that mean exactly - what is ‘crude’ about it? Crude means reported a bit high in the sense of what is actually amino acids (protein) and other nitrogen (not amino acids) in other plant tissue. When a food analysis is done chemists count the nitrogen atoms which includes nitrogen that is not in protein molecules. So, it is often a higher percent based on the analytical method. This has been a standard analysis for well over a century*. The good news is that Alfalfa has all the essential amino acids, as well as many others. Animals’ bodies can make many amino acids from foods consumed, some they can not make. The ones that a body can not make must be consumed in the food eaten. Alfalfa is a plant based source for ALL the amino acids that the body can not make but must be consumed. The total amino acid protein of alfalfa is closer to 16%, each harvest is a little bit different. Sixteen percent is comparable to the ‘old’ Mazuri.

You might notice that Alfalfa has a great Calcium to Phosphorus ratio, about 8:1. A great very high fiber profile, and based on how tortoises ‘go for it’ I believe a good taste.

“But, they don’t eat it in the wild” – well as a matter of fact Russian tortoises *Testudo horsfieldii*, do eat it in the wild. If you look at the native range of Russian tortoises and Lucerne (a different name for Alfalfa) you will see much overlap.

With so many good choices for tortoise food available why even use alfalfa? Alfalfa is readily available in many forms, as cubes, pellets, loose in bags, and often available as organic. Last time I bought a bag of organic alfalfa pellets a 50 pound bag was \$19.00 – that’s a great deal of food value for the price. A teaspoon of dry pellets moistened, broken up and mixed in with a head of chopped greens adds value, and improves diet variety as well as the nutritional values listed already in this blog.

When you read that someone should not feed alfalfa they are partially correct, it's a good part of variety and should not be more than a few percent of the total food offered. There is no reason to exclude it its use. But to offer a small amount every other to twice a week is not too much when that amount if about a teaspoon of pellets mixed in with a head of chopped greens.

If you have the space and the green thumb, and few sprigs mixed in with other backyard harvest greens once or twice a week is even better.

*<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7597951/#:~:text=The%20most%20frequently%20used%20methods,method%20has%20advantages%20and%20disadvantages.>

Look at table 1, most often used in feed analysis is the Kjeldahl method.

To see greater detail on this method: https://en.wikipedia.org/wiki/Kjeldahl_method