



# DID YOU KNOW


# SPIRULINA ALGAE IS GREAT FOR BEES

Arthrospira Platensis, an ancient superfood first used by the Aztecs is showing great promise as a bee feed.

### A PROTEIN POWERHOUSE




**60-70%**  
**RICH IN PROTEIN**



**HIGHLY BIOAVAILABLE**

**10/10**  
**ESSENTIAL AMINO ACIDS**




**BALANCED**

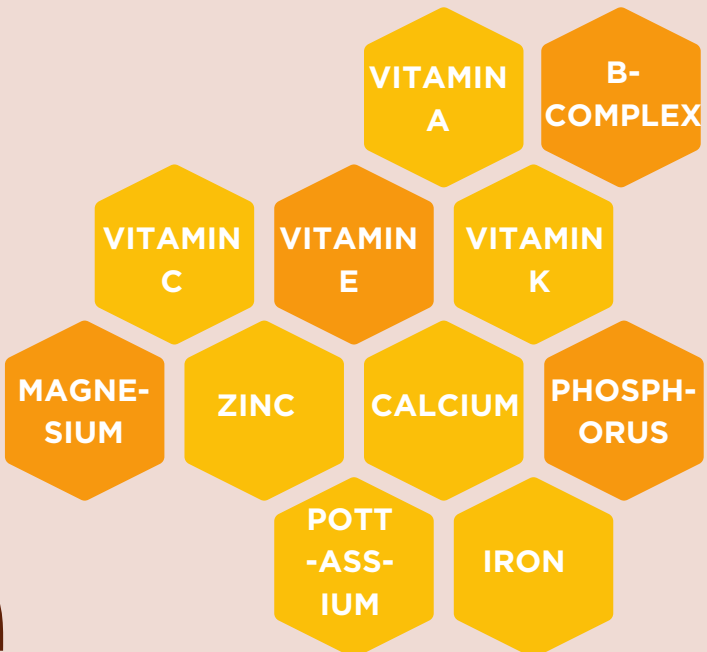
### MICRONUTRIENTS

Spirulina is a rich source of these often overlooked vitamins and minerals

But what are they good for?




- FLIGHT
- VITELLOGENIN
- FIGHTING DISEASE
- BROOD PRODUCTION
- THERMOREGULATION
- LITERALLY EVERYTHING




- VITAMIN A
- B-COMPLEX
- VITAMIN C
- VITAMIN E
- VITAMIN K
- MAGNESIUM
- ZINC
- CALCIUM
- PHOSPHORUS
- POTASSIUM
- IRON

### ANTIOXIDANTS AND IMMUNE RESPONSE

Making honey is hard work. From chemicals in the environment to those inside the hive. These make oxidative stress. Antioxidants such as chlorophyll can help mop them up





Ongoing Research by USDA scientists suggests Spirulina may help bees fight disease by upregulating the immune system with minimal "cost".



### SUPPORTS BEE FRIENDLY AGRICULTURE

CORN AND SOY	SPIRULINA
High Pesticide Use	No Pesticide Use
Destroys Bee Forage	Preserves Bee forage



# MICROALGAE AND THE HONEYBEE MICROBIOME



Why are my bees always drinking that dirty green water!?  
I just put out fresh clean water!  
Microalgae and minerals!

## SPIRULINAS PREBIOTIC EFFECT

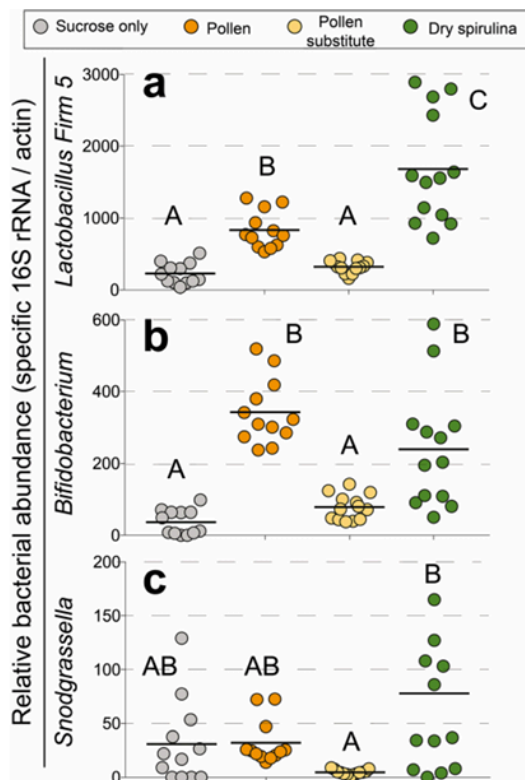


Figure 6. Relative core gut bacteria abundance in bees fed different diets at day 10 ( $n = 12-13$  cages). Each point represents an independent cage. Black horizontal lines indicate the mean. Different letters indicate Tukey HSD  $P < 0.05$ .

Ricigliano, V.A., Simone-Finstrom, M. Nutritional and prebiotic efficacy of the microalga *Arthrospira platensis* (spirulina) in honey bees. *Apidologie* 51, 898-910 (2020).

## PREBIOTIC VS PROBIOTIC

A **prebiotic** is a substrate that is selectively utilized by host microorganisms conferring a health benefit. . . so **food for the good guys**.

A **probiotic** is a live microorganism that, when administered in adequate amounts, confer a health benefit on the host. . . so **living good guys that help the good guys**

## LEARN MORE

Dr. Riciglianos' Strong Microbials Research (scroll down)

