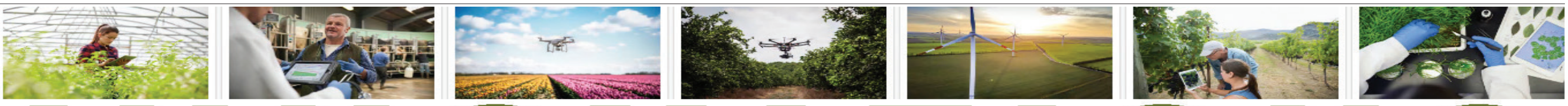


INNOVATIONS

Microbes on the menu for bee larvae

By JAN SUSZKIW
USDA ARS

MADISON, Wis. — Bees only feast on nectar and pollen, right?

Wrong. Turns out, Nature's famously busy insect isn't strictly vegan, after all.

Reporting online in the American Naturalist, a team of Agricultural Research Service and university scientists has shown that bee larvae (brood) have a taste for "microbial meat."

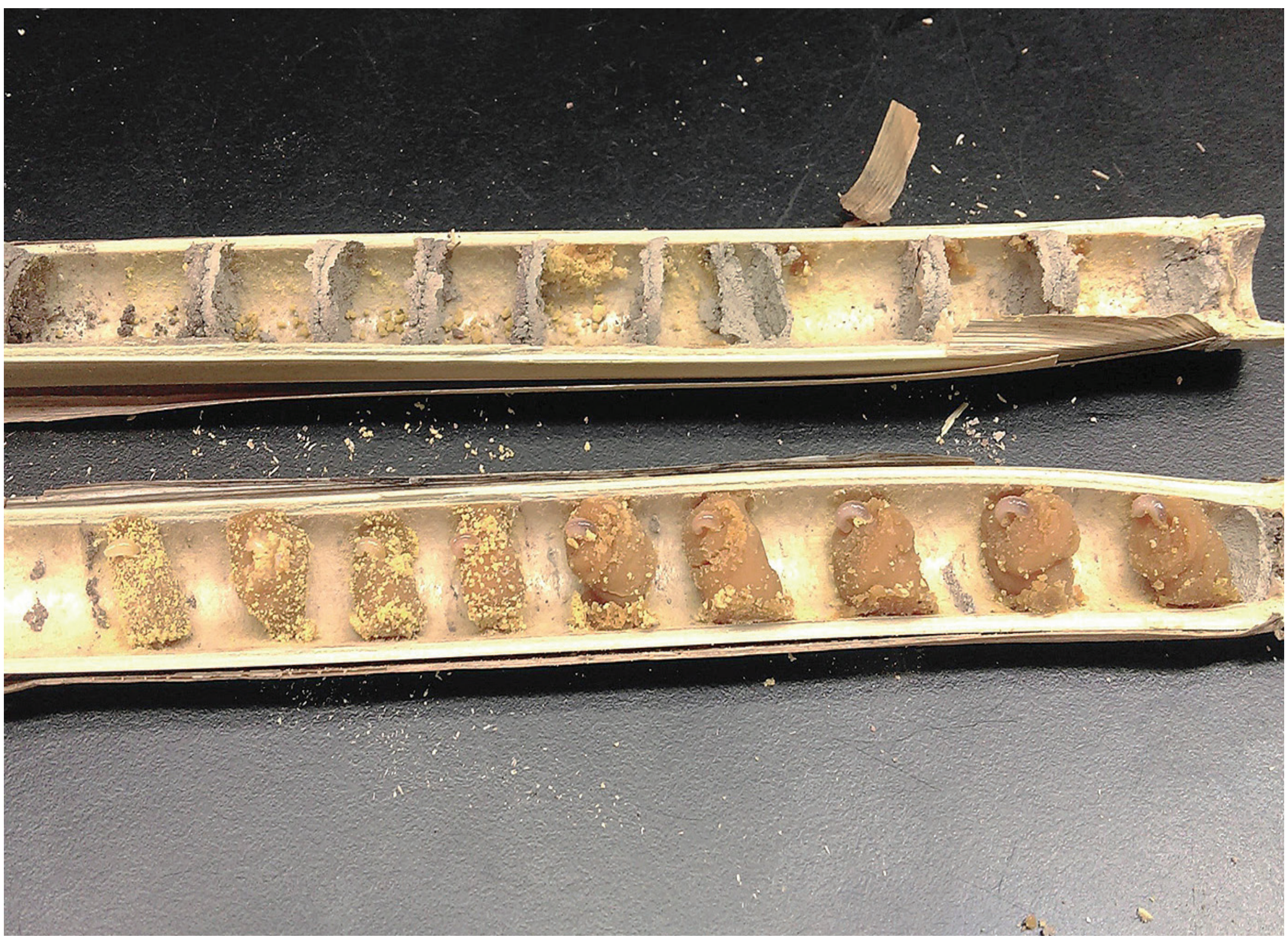
ARS entomologist Shawn Steffan and his colleagues at the University of Wisconsin, Cornell University and Hokkaido University in Japan coined the term to describe an important ingredient in the brood's pollen provisions — namely, the protein of beneficial bacteria and fungi.

The microbes are naturally occurring in the pollen and feed and multiply within it. In the process, they increase the pollen's nutritional value to brood by enriching it with amino acids — the building blocks of protein — that flowering plants alone may not always provide.

"Bees actually require the non-plant proteins of these pollen-borne symbionts to complete their growth and development — which makes them omnivores," explained Steffan, with the ARS Vegetable Crops Research Unit in Madison, Wis.

In fact, the team observed an appetite for microbial meat among brood that spanned 14 species distributed across all major families of social and solitary bees — Melittidae, Apidae and Megachilidae among them.

The microbes don't just serve themselves up as critical sources of amino acids, though. They also secrete enzymes that help break down and age raw pollen into a more nutritious and digestible form known as "beebread." Nurse bees may recognize this benefit and encourage the microbes' growth in pollen fed to brood, note the researchers in their paper. This microbial mix-mash may also check the growth of harmful bacteria or fungi that can ruin beebread or sicken the hive.



Shawn Steffan/USDA ARS

Newly hatched blue mason bee larvae feeding on pollen provisions within a hollow reed.

For their study, the researchers used isotope- and gas chromatography-based methods to calculate the ratio of nitrogen in two types of amino acids (glutamic acid and phenylalanine) in the tissues of adult bees and in beebread. The team chose the method because of its accuracy in determining an organism's trophic position — where it stands on the proverbial food web of life based on the flow of nutrients and energy from producers to consumers of these resources.

In this case, the team's isotope analysis showed that bee brood's consumption of both plant and microbial proteins warranted raising the insect's trophic status from that of a strict herbivore to an omnivore.

More broadly, Steffan said, the findings underscore the need to examine what effects fungicide use on flowering crops can have on the microbial make up of pollen fed to brood and, in turn, their development.

The Agricultural Research Service is the U.S. Department of Agriculture's chief scientific in-house research agency. Daily, ARS focuses on solutions to agricultural problems affecting America. Each dollar invested in agricultural research results in $20 of economic impact.

The best-kept secret in real estate investing

By NATE HIGGINS, MS, MBA
Equilus Capital Partners LLC

Almost every real estate investor has heard of a 1031 Exchange — a provision in the U.S. tax code that allows for the deferral of capital gains on the sale of real estate when it is exchanged for a like-kind property.

While the 1031 Exchange is a wonderful tool for the active real estate investor looking to build their portfolio, it does have its drawbacks.

Among them, the investor is under tremendous pressure from a time perspective. The investor must identify a like-kind property in 45 days and close on that property in 180 days.

Additionally, if one is looking to scale back from their active real estate holdings, a 1031 Exchange is less than ideal.

You may love real estate as an asset class, but simply don't have the desire to manage it anymore. You'd like to sell, but over the years you have steadily depreciated the properties to the point that the basis is significantly lower than what you paid for the property, while the property itself has appreciated substantially.

In other words, if you were to sell today you'd have a sizeable capital gain liability.

Enter the 721 Exchange.

A 721 Exchange involves exchanging the property for the shares of a Real Estate Investment Trust (REIT). Where this is advantageous for the property owner:

- Allows the property owner to transfer their real estate exposure from active to passive (i.e. no more headaches from managing tenants or vendors).
- The owner retains exposure to real estate as an asset class in the form of institutional grade real estate.
- Receives truly passive income in the form of a quarterly dividend (which they can also elect to reinvest to buy additional shares).
- Unlock the equity in their property without having to refinance or pay capital gains from a traditional sale.
- The transaction itself is a low- to no-fee transaction (aside from traditional brokerage and transaction fees).
- Shares are liquid and can allow the owner to sell a few shares at a time.

Disadvantages of a 721 Exchange:

- Property can only be exchanged for shares of the REIT.
- Control of the REIT's properties is not in the hands of the shareholder.
- Property must be in an LLC in order for the 721 Exchange to be initiated.

At this point, you're probably wondering, what is a REIT?

A Real Estate Investment Trust (REIT) is a company that owns income-producing real estate.

Modeled after mutual funds, REITs provide investors the opportunity to own real estate and the opportunity to access dividend-based income and along with the asset appreciation. REITs lease space and collect rent on the real estate they own. This could be a wide variety of asset classes, including apartments, medical offices, vacation rentals and industrial.

The company generates income which is then paid out to shareholders in the form of a dividend. REITs must pay out at least 90% of their taxable income to shareholders.

No capital gains deferral strategy is a magic bullet that will suit every situation.

However, there are alternatives available outside of a 1031 Exchange that will empower the real estate investor to defer capital gains while attaining passive, tax-advantaged exposure to real estate as an asset class.

Call Equilus Capital Partners to learn more: 509-665-8349.