

The *Bracha* for Hydroponically-Grown Produce

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As the population of the world burgeons and arable land seems to be growing scarcer all the while, science has forged ahead and discovered many new technologies to increase agricultural productivity. One of the most exciting and creative of these new discoveries is hydroponics.

Hydroponics can be defined as the science of growing plants without the use of soil, but by the use of an inert medium, such as sand, gravel...to which is added a nutrient solution containing all the essential elements needed by the plant for its normal growth and development.¹

This new reality raises some interesting halachic questions; for one, what *bracha* (blessing) is to be recited on such fruits and vegetables? Can one correctly call them "fruits of the ground?"

The Talmud speaks of a case that forms the basis of our hydroponic/halachic discussion. One of the reasons why this case is so fascinating is that it may be the earliest allusion to the technological future of growing "out of the ground." The case is that of the mushroom:

1. Resh, Howard M., Ph.D. *Hydroponic Food Production*, Woodbridge Press, 1991. p. 23.

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Our rabbis taught: Over anything which does not grow from the ground, such as the flesh of cattle, beasts, birds, and fish, one says [the blessing] ..."by whose word all things were created" (*shehakol*). Over...morils and truffles one says *shehakol*.²

How can we possibly make the generic *shehakol* blessing for mushrooms when they obviously grow "from the ground?"

Abaye said: "They do indeed spring up from the earth, but their sustenance is not derived from the earth!"³

Abaye's statement has considerable implications not only for mushrooms, but for all hydroponically-grown food. If one can be certain that the plant is receiving no sustenance from the soil, but is instead receiving its necessary nutrients from some other source,⁴ then halachically we cannot view that fruit or vegetable as having grown *from* the ground; rather it is merely growing *in* the ground. Our rabbis somehow knew mushrooms to be such a case.

We, of course, could never pronounce with any degree of halachic certainty that a given tree or vegetable which is located in the ground is merely being supported there without any nourishment. But in the case of a tomato bush growing in a bucket of rocks in the corner of someone's office, there is certainty about its source of sustenance. Therefore it is proper to say *shehakol* before eating hydroponically-grown fruits and vegetables even though they are species which normally require more specialized blessings. Rabbi Ovadiah

2. *Berachot* 40b.

3. *Ibid.*

4. For example, it is the opinion of the *Magen Avraham* that mushrooms derive their nourishment from the air. *Orach Chaim* 204:4.

Yosef confirms this in his "ground-breaking" article:

As far as hydroponically-grown produce is concerned, there is no sustenance whatsoever derived from the soil...the blessing recited over them should be *shehakol*, as is the case for mushrooms.⁵

There are two points which should be clarified at this time. First, although it is true there is a difference in blessings between a soil-raised and a hydroponically-grown apple, this difference is based on a botanical subtlety:

In soil both the organic and inorganic components must be decomposed into inorganic elements...before they are available to the plant. These elements...are exchanged into the soil solution where they are absorbed by the plant. In hydroponics, the plant roots are moistened with a nutrient solution containing the elements.⁶

What Abaye is really pointing out is that no matter how this apple was grown, it had to receive the same necessary inorganic elements through a liquid medium; since one process is based on a natural soil solution and the other relies on a man-made solution,⁷ we must make a distinction between them. The distinction is the blessing we say for it.

The second fact we should note is that the case of the mushroom must be truly unique; there are no other examples

5. *Yechave Daat* 6:12 p. 77.

6. Resh, *Hydroponic Food Production*, p. 37.

7. There are "organic" hydroponic solutions available which meet the rising demand of the strictly organic farmer, but because they do not contain any soil solution these should not make any difference in this discussion. If, however, you add a handful of soil to water and attempt to grow something via this combined solution, there will be grounds to necessitate the normal, more specific blessing. See *Nechpa Bakesef, Yoreh Deah* 1:5.

of plants living in the ground which have no nutrient interaction with the ground.

However, some disagree with the *psak* of Rav Ovadiah Yosef. The *Shevet HaLevi* believes that one should not make a distinction in blessings for hydroponically-grown produce because they are not fully equivalent to the unique mushroom:

...It would seem that [hydroponics] is not like mushrooms. For every mushroom derives sustenance from the air, while this [hydroponically-raised] fruit or vegetable belongs to a species that is generally grown in the earth.⁸

The *Shevet HaLevi* chooses to ignore how any individual food item was grown, but focuses rather on the larger picture of how the species normally grows. A mitigating factor and objection to his approach is appearing on the horizon. There are staggering statistics that suggest an enormous rise in the overall quantity of hydroponically-raised produce; certain countries already boast that they grow more flowers hydroponically than in any other way. A time may come when we will not be able to say that a given species is "generally grown in the earth."

For those who do hold like Rav Ovadiah Yosef, there is an interesting problem. Does the hydroponically-raised individual fruit or vegetable (of a species normally grown in the ground) have any halachic connection with the earth? For example, if one were to accidentally make the blessing "...*borei pri haetz*" before eating a hydroponically-grown apple, would this blessing be acceptable?

One might first try to answer this by examining what the same law would be in the case of the mushroom, i.e.

8. *Shevet HaLevi* 205:204.

can one who accidentally said the blessing *borei pri ha'adama* rely on this blessing for the mushroom? The *Aruch HaShulchan* suggests that in such a case the erroneous blessing would be valid because, after all, mushrooms do grow *in* the ground even if they do not grow *from* the ground.⁹ The problem with a hydroponically-raised fruit or vegetable is that it doesn't seem to have any connection with the soil of the earth whatsoever.

Still, Rav Ovadiah Yosef rules that, just as for the mushroom, one who mistakenly recites *borei pri ha'adama* on a hydroponically-grown tomato may rely on the blessing. Why? He lists a few reasons, but one in particular should raise some questions. He claims that because the *Aruch HaShulchan* allowed a mistaken *borei pri ha'adama* to work on mushrooms, the same should be true for hydroponics. However, as was pointed out, the *Aruch HaShulchan's* reasoning was that the mushroom grew while still physically located in the ground; a tomato growing in a bucket in the corner of an office, on the other hand, has no connection with any ground at any time.

Careful scrutiny of Rav Ovadiah Yosef's wording,¹⁰ however, reveals that he never intended to discuss situations of office-produced tomatoes. Instead, he was ruling only regarding a situation in which trenches had been dug in order to replace soil with an inert hydroponic medium such as sand or gravel. In such a case we can see the similarity to mushrooms, where these vegetables are being grown in the ground without deriving any sustenance from the ground.

9. *Aruch HaShulchan, Orach Chaim* 204:5.

10. *Yechave Daat* 6:12, "...For the water [i.e. nutrient solution] in such a [hydroponic] system *divides* between the seed and the soil."

It is extremely doubtful that the *Aruch HaShulchan* himself would ever have allowed a mistaken *borei pri ha'adama* to be valid for a tomato grown indoors, as described above.¹¹

Dayan Falk, in his work *Machaze Eliyahu*,¹² speaks with the greatest proficiency when referring to the field of modern hydroponics. He is compelled to distinguish immediately between two major methods of hydroponic gardening: 1) growing fruits or vegetables in a system completely removed from the earth (i.e. indoors), and 2) growing in a system such as Rav Ovadiah Yosef describes, in which trenches are dug in the ground and produce is grown through an inert medium.

Dayan Falk rules that in the first case it is appropriate to say *shehakol*. He deduces this from a *Yerushalmi*¹³ in tractate *Kela'im* that remains uncertain whether one can recite "...*Hamotzi lechem min ha'aretz*" on bread made from wheat grown in a container full of soil but totally separated from the ground itself. This is accomplished halachically by making sure that there are no holes in the bottom of the container so that no exchange can take place between the plant and the ground below. The *Yerushalmi* does not make any certain conclusion regarding the wheat, even though it was grown in soil. Perhaps, conjectures Dayan Falk, the difficulty lies in the text of the blessing itself – can one really say "...He who brings forth bread from the land" when the wheat never touched the land? If this is true, then surely the rabbis in

11. One might still be able to argue that a mistaken *borei pri haetz/ha'adama* should be sufficient based on the opinion of the *Shevet HaLevi* discussed above. Perhaps in the case of a mistake we should rely on his opinion that the more specific blessing should always be said.

12. 28:4.

13. Jerusalem Talmud, *Kela'im*, chapter 7.

the *Yerushalmi* would have no doubt about wheat or fruit or vegetables grown in an office in a hydroponic planter; they would be very certain that the words "land" and "earth" are inappropriate in blessings for such foods. Such certainty would compel us to make a *shehakol* over hydroponically-grown produce.

But perhaps the *Yerushalmi* fails to render a decision for an entirely different reason. Maybe it is certain that *Hamotzi* is inappropriate in the case of this bread, but feels that we should always stick to the "normal" blessing notwithstanding how any individual batch of wheat or vegetables was produced. If this was their reasoning, then the rabbis would be in doubt about hydroponically-grown produce.

Dayan Falk notes that what emerges is an interesting *safek* (doubtful situation): it is unclear what the *Yerushalmi* is uncertain about. On the one hand, they may not have arrived at a conclusion regarding the bread, but they are sure about the *shehakol* blessing for hydroponically-grown produce; or, they have the same problem with hydroponics as they do with the bread. Therefore, since we have a principle, "when in doubt regarding a blessing, be lenient,"¹⁴ it is best to use the broader blessing in both these cases. Thus, on the bread in question one should say, "...*borei minei mezonot*" just in case the actual mention of *aretz*, land, is inappropriate, and on our office-grown tomato one should say *shehakol*. In the second method of hydroponic farming, Dayan Falk concludes that the same *safek* still exists and therefore it is better to make the more general blessings.¹⁵

14. *Shabbat* 23a.

15. This latter case poses some possible problems, however. What stops the roots from growing down through the gravel into the soil itself? Does there have to be some sort of a barrier between the hydroponic medium and the ground?

Finally, what do you do if you arrive in a supermarket and buy a head of lettuce without knowing if it was grown normally or hydroponically?

Regular fruits and vegetables found in the marketplace...are mostly grown in the ground.¹⁶

According to this logic one should say the normal, specific blessing since the majority of fruits and vegetables available are grown in the earth. But produce demographics are changing; amidst dwindling resources such as water, land, and fertilizer (many hydroponic systems are "closed" and recycle nutrients), more and more hydroponically-raised fruits and vegetables (and even flowers) are becoming a necessity. Can we rely on the majority principle if we shop at a store which we suspect purchases from hydroponic growers, and are we obligated to find this information out?

Hydroponics is rapidly changing the face of the world we live in. Even in Israel, the parched desert of Ein Gedi is now dotted with stunning vegetation being grown in sophisticated recirculating hydroponic systems. NASA now boasts of being able to sustain people in space using hydroponically-grown food. But however the lettuce or tomato of tomorrow arrive, they will be rooted in a stabilizing "four cubits of halacha"¹⁷ which always wants to know what Torah principle can be revealed by this new challenging circumstance.

16. *Yechave Daat* 6:12. To understand why we do not say here "when in doubt regarding a blessing, be lenient," see page 79 of his *teshuva*.

17. *Berachot* 8a.