

## HIDDEN INGREDIENTS

### The Kashrus of Food Additives

A curious allusion to Mordechai in the Gemara opens a window onto one of the most complicated areas of modern kashrus. The Gemara asks: “Mordechai *min haTorah minayin?*” — where is Mordechai alluded to in the Torah? It answers with the words “*mor deror*” — “flowing myrrh” (*Shemos* 30:23), one of the ingredients of the sacred anointing oil, which Targum renders *mira dachya*, linguistically recalling the name Mordechai (*Chullin* 139b). But what exactly was *mor*? The Rambam identifies *mor* with musk, a fragrant substance derived from the blood or bodily secretions of an animal found in India (*Hilchos Klei HaMikdash* 1:3). The Raavad challenged this identification. How could the sacred *Shemen HaMishchah* contain something derived from blood—and, in his understanding, from a non-kosher animal? Ramban vigorously objects on the same basis (*Shemos* 30:23). Ramban therefore identifies *mor* as a fragrant plant resin — myrrh — rather than an animal derivative. The description “flowing” myrrh is particularly apt for resin that exudes from a tree. The Magen Avraham (*Orach Chaim* 216:3), however, explains the Rambam on the basis that we judge the musk *basar hashta*—according to what it is now. Its original identity has changed, and it has become *pirsha be'alma*, mere refuse or dust. The *Lechem Asher (Ki Sisa)* uses this to explain the Gemara's cryptic association with Mordechai. One might have criticized Mordechai for provoking Haman rather than avoiding confrontation. But a person's actions cannot be judged merely from what appears to be a dangerous situation at the outset. We know the end of the story: Mordechai's greatness is attested to by his ultimate role as a leader of the Jewish people, one of the *Anshei Kneses HaGedolah*. The Torah refers to Mordechai as *בְּשֵׁם רֹאשׁ*, the head of spices, and Chazal demonstrate Mordechai's greatness by associating him with the oil used to anoint kings and Kohanim Gedolim.

### PROCESSING TRANSFORMATION

We encounter a similar concept in the context of food additives. A substance may originate in something prohibited, yet by the time it reaches us, it may bear little resemblance to its source. Does Halachah follow where an ingredient came from, what it has become, or the function it performs in the final food? That question now regularly confronts the kosher food industry. Rav Asher Weiss addresses this broader phenomenon in his discussion of *panim chadashos b'maachalos asuros* — “new faces in prohibited foods” (*Minchas Asher, Bereishis* 69). He examines whether a substance derived from a forbidden food remains prohibited after undergoing a complete transformation. He distinguishes among three situations. If the original forbidden food remains intact but is consumed in an abnormal manner, it is generally still prohibited rabbinically. If it has merely become unfit for normal consumption, eating it may likewise remain prohibited because the consumer thereby assigns it significance. However, when it has entirely lost its identity as food and become “mere refuse,” “dust,” or “wood,” its original prohibition disappears. Examples include a forbidden creature burned to ashes, a thoroughly dried stomach lining used as rennet in cheese-making, and digested non-kosher fish and worms that have disintegrated inside larger fish such as tuna.

### PANIM CHADASHOS

A second, more remarkable principle is *panim chadashos ba'u lekan*: even an edible and desirable product may be permitted when its nature has been so fundamentally transformed that it is regarded as a new substance. We discussed this principle in Daf Topics No. 260 in connection with glycerin, where we cite the Rosh (*Berachos* 6:35), who presents a *machlokes* between the Baal HaMaor and Rabbeinu Yonah regarding the permissibility of musk. Rabbeinu Yonah permits this spice, comparing it to the legs of bees in honey. By osmosis, honey draws moisture from those legs, causing them to disintegrate into the honey. Rabbeinu Yonah describes the source of the musk fragrance as a blood-like substance that accumulates in a swelling near the animal's neck and is processed into musk. Rabbi Weiss contrasts this positive transformation, in which food attains a new identity, with another form of transformation. When a substance has deteriorated so completely that it has ceased to be food and has become mere waste or dust, it is entirely outside the category of forbidden food. Once its taste has entirely disappeared, it loses its halachic identity as food. (As an aside, modern zoology confirms that musk is a glandular secretion produced in a pouch on the lower abdomen of the male musk deer. The picture I obtained shows it as pod-shaped. I found a reconciliation of this apparent contradiction regarding location in the above-mentioned Ramban. He first cites the Ibn Ezra, noting that the information that it was on the throat came from local musk suppliers. However, when the Ramban proceeds with his own explanation, he describes the location as on the animal's abdomen, thereby correcting the information held by the other Rishonim.)

### RECONCILING RABBEINU YONAH

The Magen Avraham challenges Rabbeinu Yonah on milk, whose permissibility the Gemara describes as a special Scriptural novelty despite its supposed origin in blood, and on an embryo from a *tereifah* egg, which is permitted only because the egg first decomposes. This indicates that transformation alone is insufficient. Rabbi Weiss cites the Chasam Sofer, who suggests that both deterioration and subsequent transformation may be required, but finds no such distinction in Rabbeinu Yonah's words. Rabbi Weiss understands Rabbeinu Yonah to hold that a complete, essential transformation can itself remove the prohibition. He explains that an egg and its embryo constitute a single biological entity, so the embryo requires the egg's prior decomposition to become permitted; musk, by contrast, is a genuinely new substance produced from a minute quantity of blood in a specialized gland. The Torah's permission of milk from an animal may not be an isolated exception but rather the source of a general rule that when a prohibited substance truly acquires an entirely new identity, its former prohibition can cease. Modern food technology can subject raw materials to chemical and biological processes that Chazal could scarcely have encountered in their physical form. Enzymes, extracts, and other processing agents may originate in prohibited materials yet undergo transformations so extensive that the finished substance bears neither the taste nor the appearance of the original material. This raises several distinct halachic concepts. There is *nosen taam*: does the prohibited material impart a recognizable taste? There is *nifsal mei'achilas adam*: has it become so inedible



“Mor” - gland from the male musk deer - or myrrh resin

that it has lost its halachic identity as food? There is *panim chadashos*: has processing created something sufficiently new that the original prohibited substance can no longer be regarded as present in its former identity? There is an even more fundamental question: was the starting material itself halachically regarded as food? These distinctions become particularly striking when we examine an ingredient with the unappetizing name L-cysteine.

### HAIR IN YOUR BREAD?

L-cysteine is a common amino acid used in the food industry, with two distinct main applications. In bakeries, it serves as a dough conditioner by reacting with sulfur bonds in wheat proteins to relax gluten and ease processing. It also plays a key role in flavor creation; during heat browning, L-cysteine reacts with sugars to produce roasted, chicken-like, or beef-like flavors, some of which may be certified *pareve*. Its source has raised kashrus concerns, as it is historically derived from human hair, poultry feathers, and pig bristles. These sources contain cysteine compounds, which manufacturers hydrolyze with hydrochloric acid to extract the amino acid. Despite sounding alarming—like “pig bristles in bread”—halachically, these substances—hair, bristles, feather spines—are considered inedible, akin to “*etz b'alma*” (mere wood). Unlike gelatin, which involves debates about collagen derived from animal tissue, L-cysteine’s permissibility hinges on whether its source was ever classified as prohibited—a prior question that simplifies the issue. If feathers come from non-kosher poultry, they are typically scalded in hot water to remove them. These feathers have been heated alongside non-kosher birds and blood, raising questions about whether non-kosher flavors could have been absorbed into the L-cysteine. Several factors influence this: the feather’s core is horn-like; the water used is foul; and the manufacturing process involves hydrolysis with strong hydrochloric acid, which renders the final product inedible. Therefore, any absorption from the poultry does not necessarily pose a kashrus concern for the L-cysteine. It’s important to note that simply knowing “it came from a chicken feather” is not enough. One must understand which part of the feather, its initial halachic status, what it absorbed, whether that absorbed material retained taste, the chemical processes involved, and the final substance produced. Modern kashrus involves understanding the entire manufacturing process, not just reading ingredient lists (Kosher Food Production by Rav Zushe Yosef Blech, Chapter 17, pp. 374-8).

### THE ENZYME PROBLEM

Enzymes make this even more complicated. An enzyme is not generally added for its taste. It is a catalyst: it enables or accelerates a biochemical reaction. Tiny quantities can perform an important manufacturing function while contributing virtually nothing identifiable to the finished product’s taste or appearance. This creates an unusual halachic tension. In ordinary *ta’aroves*, the classic question is whether the prohibited substance contributes *taam*. Rav Asher Weiss highlights the modern problem of enzymes used in food manufacturing that lack significant taste or appearance. The relevant question, therefore, cannot always be reduced to the familiar calculation of *shishim*. We must first determine what the enzyme is, its source, whether it is itself edible, how it was manufactured, whether it remains in the product, and what halachic significance attaches to its function. Modern enzymes may themselves be products of fermentation. A microorganism is supplied with nutrients and induced to manufacture a desired enzyme. The final enzyme may consequently be many technological stages removed from the original nutrient medium. This shifts the kashrus investigation backward through the production chain: What organism was used? On what substrate was it grown? What nutrients were supplied? Were animal-derived processing aids involved? What purification steps followed? Interestingly, L-cysteine itself demonstrates the changing technology. Rather than extracting it from hair or feathers, manufacturers can produce it through enzymatic conversion, and newer methods use microorganisms whose metabolic pathways have been altered to produce L-cysteine by fermentation. The ingredient may have the identical chemical name, yet its halachic history can be completely different (Kosher Food Production, pp. 288-295).

### EMULSIFIERS: SMALL INGREDIENT, MAJOR FUNCTION

A similar issue arises with emulsifiers. Oil and water naturally separate. An emulsifier attracts both oil and water, allowing substances that would otherwise separate to remain mixed. Emulsifiers are therefore ubiquitous in processed foods — bakery products, confectionery, margarines, sauces, and innumerable manufactured foods. Here again, the label tells only half the story. Many emulsifiers are manufactured from fatty acids. Those fatty acids may originate in vegetable oils or animal fats, and after processing, the resulting molecules may be essentially indistinguishable. The kosher consumer, looking at the finished product, cannot determine its source. The halachic question is therefore not merely whether the finished emulsifier “looks” or “tastes” non-kosher. Its production history matters. Unlike a trivial contaminant, an emulsifier is deliberately added because it performs an essential function in the product. This is one reason why simplistic appeals to *bittul* are dangerous in industrial kashrus. A material present in minute quantities may nevertheless be intentionally added and be crucial to the physical character of the food. Questions of *ma’amid*, *davar hama’amid*, *nosen taam*, intentional addition, and the particular status of the ingredient must each be examined on their own terms (Kosher Food Production, pp. 283-287).

### LANOLIN — AN ANIMAL SECRETION AS A FOOD ADDITIVE

Lanolin acts as a notable link between musk and contemporary food additives. It is the purified, wax-like substance that coats sheep’s wool, collected during raw fleece washing, and then refined, bleached, and deodorized. Although mainly used in cosmetics and pharmaceuticals, lanolin and its derivatives have also been utilized in chewing gum and as emulsifiers in food products. Its animal origin raises a halachic question: can a secretion taken from a live animal be consumed? Rabbi Yehoshua Moshe Aronson initially regarded “wool fat” as animal fat and raised serious concerns (*Yeshu’as Mosheh* 2:81). However, Rav J. David Bleich explains that this is chemically incorrect: lanolin is a glandular lipid secretion from the sheep’s skin, not fat derived from its flesh. Rav Bleich reasons that there are compelling grounds to permit the use of lanolin. According to the Beis Yosef’s ruling that substances secreted by kosher animals are permitted, including urine, secretions from a kosher species may be allowed (*Yoreh De’ah* 81:5). Furthermore, lanolin is inedible when secreted, and its extraction via soap and sodium carbonate renders it even less suitable for eating. As a result, even those wary of musk might have valid reasons to permit lanolin as a food additive (Tradition, 23:4).

In kashrus, knowing what an ingredient is not enough. One must also know what it was – and precisely what happened to it along the way.