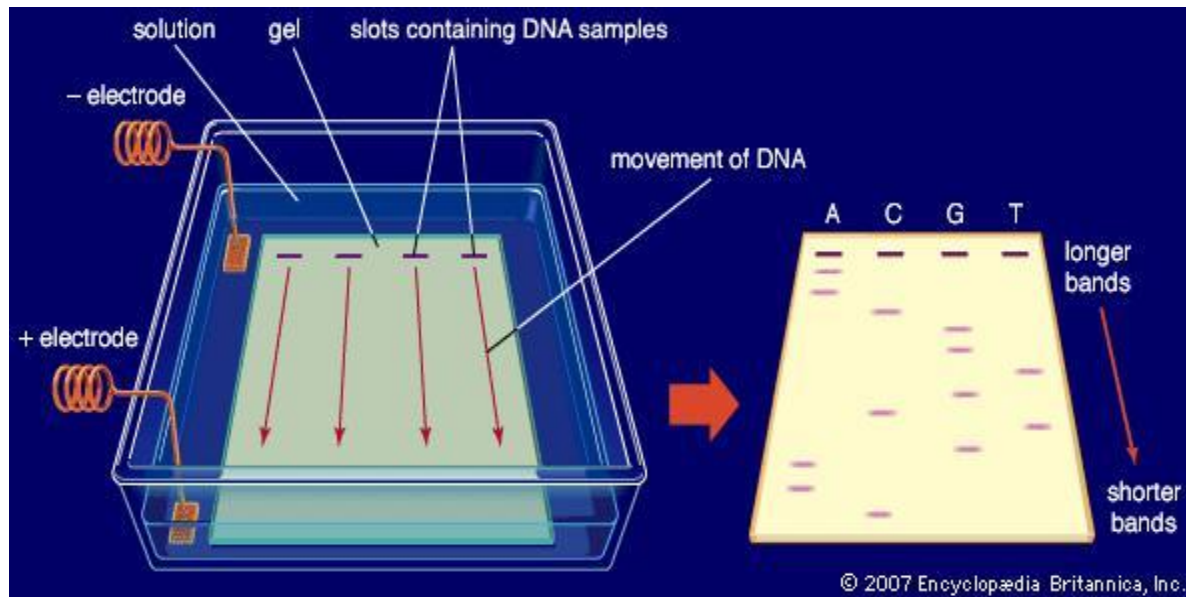


# From Australia to Sweden: Mitochondrial DNA in Halacha

Tzvi Benoff

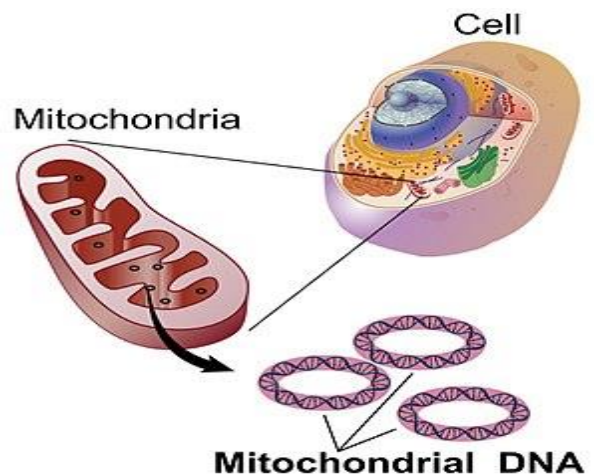


## Gene tests show that two fifths of Ashkenazi Jews are descended from four women (U. Chicago 2006)

Four “founding mothers” who lived in Europe a thousand years ago were the ancestors of two fifths of all Ashkenazi (European origin) Jews. This is the conclusion of a team of researchers at the Technion, Haifa, after they compared DNA sequences from nearly 2000 Jews with those of 11 500 non-Jewish people in 67 different populations around the world.

The team, which studied mitochondrial DNA (mtDNA) passed on solely by mothers to their children, found evidence of shared maternal ancestry of Ashkenazi and non-Ashkenazi Jews, a

finding showing a shared ancestral pool that is consistent with previous studies that were based



on the Y chromosome. This evidence pointed to a similar pattern of shared paternal ancestry of Jewish populations around the world originating in the Middle East. They concluded that the four founding types of mtDNA—likely to be of Middle Eastern origin—underwent a major overall expansion in Europe over the last thousand years.

The “four founding mothers,” he added, “are from lineages that originate long before the launching of the Jewish people some 3400 years ago. They probably came from a large Middle Eastern gene pool.

Study Results*	
Statistics of Jews with Specific Haplotype: 54/1500 (3.6%)	Gentiles with Specific Haplotype: 7/51000 (.014%)
Jewish Global Population: 15 million	World Population: 7.3 Billion
Jews with Specific Haplotype: 540,000	Gentile with Specific Haplotype: 100.8 million

\*all figures are rough statistical estimates and contain many assumptions

*Jews are almost 300 times more likely to have the specific haplotype than non-Jews, but only make up .54% of the world population with it.*

- Which person has a higher probability of having this haplotype: Jew or Gentile?
- Which person with this haplotype has a greater likelihood of being picked out of a random sample: a Jew or Gentile?

## Paradigms for Mitochondrial DNA:

Paradigm	Case in Gemara
אומדנא - Umdena (Assume as a given)	Torts and capital punishment
רוב – Rov (Majority)	Kosher meat and unidentified children
סימן - Siman (Sign)	Returning lost objects

## Umdena (Expected Behavior)

### 1. Sanhedrin 37b

תניא א"ר שמעון בן שטח אראה בנחמה אם לא ראיתי אחד שרץ אחר חבירו לחורבה ורצתי אחריו וראיתי סייף בידו ודמו מטפטף והרוג מפרפר ואמרתי לו רשע מי הרגו לזה או אני או אתה אבל מה אעשה שאין דמך מסור בידי שהרי אמרה תורה (דברים יז, ו) על פי שנים עדים יומת המת היודע מחשבות יפרע מאותו האיש שהרג את חבירו אמרו לא זזו משם עד שבא נחש והכישו ומת

It is taught in a baraita that Rabbi Shimon ben Shataḥ said: [I once saw] one person pursue another into a ruin, and I pursued him and saw a sword in his hand, dripping with blood, and the one who was ultimately killed was convulsing. And I said to him: Wicked person, who has killed this man? Either you or I. But what can I do, since your blood is not given over to me, as the Torah states: "At the mouth of two witnesses, or three witnesses, shall he that is to die be put to death" (Deuteronomy 17:6), [and I did not witness you killing him]. The One Who knows one's thoughts shall punish this man who killed another. The Sages said: They did not move from there before a snake came and bit the murderer, and he died.



### 2. Bava Basra 93a

רבי אחא אומר גמל האוחז בין הגמלים ונמצא גמל הרוג בצדו בידוע שזה הרגו  
Rabbi Aḥa says that in the case of a rutting male camel that is rampaging among other camels and another camel that was found killed at its side, it is evident that this rampaging camel killed it. [Therefore, the owner of that camel is liable.]

## Rov (Majority)

### 3. Exodus 23:2

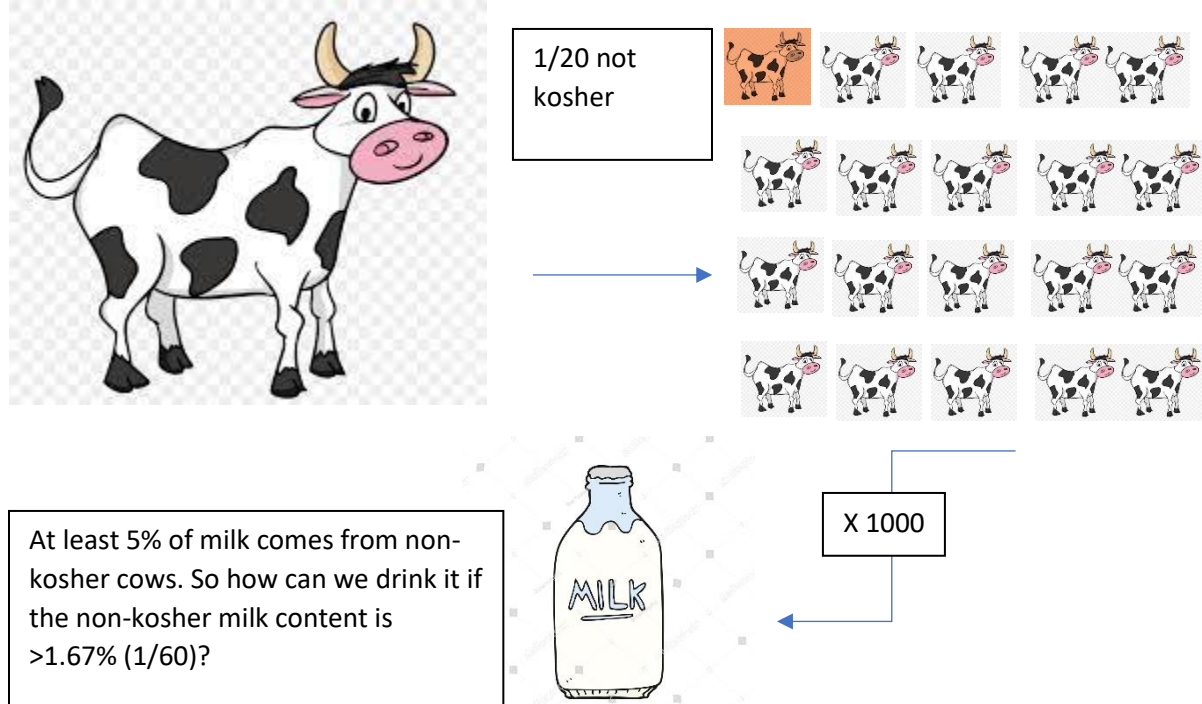
לֹא-תִהְיֶה אַחֲרֵי-רַבִּים לְרָעָה וְלֹא-תִעָנֶה עַל-רֵב לְנֹטָת אַחֲרֵי רַבִּים לְהָטָה  
You shall not follow the majority for evil, and you shall not respond concerning a lawsuit to follow many to pervert [justice]. You should follow the majority to for good.

### 4. Chullin 11a

מנא הא מילתא דאמור רבנן זיל בתר רובא מנלן דכתיב (שמות כג, ב) אחרי רבים להטות רובא  
דאיתא קמן כגון ט' חנויות וסנהדרין לא קא מיבעיא לן כי קא מיבעיא לן רובא דליתיה קמן...

What is the source for our sage's statement that we follow the majority? It says "follow the majority." But we are not asking about a case where the majority is before us like the case of 9 stores or a court. Rather, we are asking about a case where the majority is not before us?

## 5. Milk from a Possibly Treif Cow (OU Kosher Staff August 15, 2007)



Halacha states that milk from a tereifah animal – meaning an animal which suffers from a mortal wound, as understood by Chazal – is non-kosher. (Shulchan Aruch, Yoreh Deah 81:1) This prompts a good question: How can one know whether or not the milk he consumes is from a tereifah cow?

There is another halachic axiom that "Rov beheimos kesheiros" - "Most animals are presumed to be kosher" (and one need not suspect that they are tereifos – Chulin 12a [v.Rashi d.h. Pesach] and Shach s.k. 2 on YD 39:1). Thus, one can safely assume that the milk from a randomly-selected cow is kosher, unless data to the contrary is provided.

In contemporary times, when dairy farms and milk processing have become industrialized and are subject to the demands of a mass-production society, there may be additional factors to consider. Let's take a look.

As a result of a diet that is heavy in grain, dairy cows sometimes suffer from displaced abomasum (hereafter referred to as "DA"). This condition signifies that the fourth stomach section – the abomasum – has moved out of position, due to built-up gas or fluid. DA impedes a dairy cow's maximum functionality, and it is often addressed by veterinary intervention. (See

Metabolic Diseases of Dairy Cattle-Displaced Abomasum, BJ Harris and JK Shearer – University of Florida-IFAS Extension.)

Although there are several treatments available to rectify DA, one common treatment involves piercing the three walls of the abomasum by making three unaligned holes, allowing for the release of excess gas when the holes are momentarily aligned. Some poskim have questioned this procedure, suggesting that it might render a cow a tereifah (as a punctured abomasum, or keivah, makes an animal a tereifah – YD 48:1)...

## 6. Minchas Asher Shemos 43:4

**ולענ"ד כל מהומה הזו בטעות יסודה, ויסוד הטעות במה שהחליפו בין דין תורה דאחרי רבים להטות ל"מדעי הסטטיסטיקה", דאף אם אמנם נכון הדבר שבהסתברות סטטיסטית אי אפשר לומר על עדר בהמות שכולן כשרות, אלא יש להניח שכשאחוז המיעוט הכללי יהיה אשר יהיה, כך אחוז המיעוט גם בעדו זה, אך לא כן בדין תורה דאזלינן בתר רוב, ולפי משפט התורה דיינינן בכל בהמה דין כשרה וממילא אף אם יצטרפו בהמות רבות, כולן כשרות לפי דין תורה.**

**In my humble opinion, this entire uproar is based on fundamental error. The root of this mistake is that they have conflated the Torah's principle of "following the majority" with "statistical science."** Even if a certain conclusion might correct from a statistical point of view, it is impossible to say that then entire corral of animals is kosher. Rather, we assume that a universal statistic would hold true for this corral. But that is not true regarding the Torah's principle of "following the majority." According to the Torah law, we deem every animal to be kosher, and therefore even if they would subsequently get mixed together, they would all be kosher according to the Torah.



## 7. Machsirin 2:7

מצא בה תינוק מושלך אם רוב עכו"ם. עכו"ם. ואם רוב ישראל. ישראל. מחצה למחצה ישראל רבי יהודה אומר הולכין אחר רוב המשליכין

If one finds an abandoned baby [in the middle of a city], if the majority of the inhabitants are Gentiles, then it is a Gentile. If the majority of the inhabitants are Jews then it is a Jew. If the city has half Gentiles, and half Jews, then it is a Jew. Rabbi Yehuda says that one bases the calculations by only considering those who would [generally] abandon children.

## Siman (Sign)

## 8. Chullin 96a

אמר רב יצחק בריה דרב משרשיא: תדע, דאילו אתו בתרי, ואמרי: פלניא דהאי סימניה והאי סימניה, קטל נפשא - לא קטלינן ליה, ואילו אמרי: אית לן טביעות עינא בגויה - קטלינן ליה.

Rav Yitzchak the son of Rav Mesharshiya said, "We should know [that recognition is stronger than simanim (identifying factors) because] if two people would come [court] and say, "A person with such and such signs killed someone," we would not kill the person [who matches those signs], but if they would say "we recognize him," then we would kill the person.

## 9. Yevamos 120a

אין מעידים אלא על פרצוף פנים עם החוטם, אע"פ שיש סימנים בגופו ובכליו למימרא, דסימנים לאו דאורייתא; ורמינהי: מצאו קשור בכיס ובארנקי ובטבעת, או שנמצא בין כליו, אפילו לזמן מרובה - כשר! ... אמר רבא: דכולי עלמא - סימנים דאורייתא, הכא בשומא מצויה בבן גילו קמיפלגי, מר סבר: שומא מצויה בבן גילו, ומר סבר: אינה מצויה בבן גילו.

We only testify [regarding a dead husband] about the face and nose even if there are other distinguishing features...Does this mean to say that signs are not effective on a Biblical level? But we have learned that if one finds [a divorce bill] tied to purse, money bag, or signet ring, or it was found amongst other possessions, even if it was there for a very long time, it is still kosher?! Rava answers that everyone holds that signs are effective on a Biblical level, and [the case of our mishnah reflects one side of a dispute] regarding finding a mole on someone who looks like the husband. One opinion (the author of our mishnah) says that they are found [and are thus not valid distinguishing features] and the other says they are not found.

## 10. Ritva Bava Metzia 27b

ושמא י"ל דשני לן בין היכי דצריך לבדוק כל החיים שבעולם שהם רבים וא"א דליכא חד דהאי סימניה ובין היכי דלא צריך לבדוק אלא המתים שבאותה עת דמועטין נינהו

Perhaps there is a difference between when we need to consider all living people in the world -which are very many – and it is impossible that there isn't someone else with those signs, and when we only need to consider those that died at that particular time which are much less



"I think we need a new sketch artist."

## 11. Minchas Asher Devarim 39:2

**ונראה עיקר במה דלא מהני סימנים לדון את הרוצח, דבאמת פשוט מאד ואין סימנים בירור מוחלט**  
שהרי ברור כשמש דיש חפצים רבים עם אותם הסימנים, דהלא מנין הוי סימן וכן קשר ומדות ארכו ורוחבו ומשקלו וכדו' וברור שכמה חפצים הם במדה ומשקל אחד ובמנין אחד וכדו' וכיון שכן פשוט דאין להרוג

אדם או לענשו בסימן גרידא דאיך נחליט שהוא הרוצח אם ידעין במציאות שיש עוד כמה אנשים עם אותם הסימנים ואפשר שהם הרוצחים, **ולא אזלינן בתר סימנים אלא לקבוע את זהותו ובעלותו של דבר שנאבד ונמצא** כגון באדם שנאבד ... ומצינו מת עם אותם הסימנים דבזה שורת הדין לתלות דזה שאבד הוא המת שנמצא ולא לחשוש דעוד אדם עם אותם הסימנים יצא מן הכלל ופירש למות, וכן באבידה שנמצא ואחד טוען שנאבדה לו אבידה עם אותם הסימנים והוא שנאמן שנאבד כמ"ש התוס' ב"מ כ"ב ע"ב (ועיין אבן האזל פי"ג מגז"א ה"ה בביאור דבריהם) דבזה תלינן דהנמצא הוא הנאבד ואין חוששין שמא חפץ אחר עם אותם הסימנים נאבד ג"כ ובזה עדיף טב"ע מסימנים, כנ"ל ברור.

**It appears that the main reason why signs don't work to convict a murderer is because it is quite obvious that signs are not complete proof.** It is obvious to all that there are many objects with similar signs (for quantity, knots, measurements, and weights [are all valid signs]). And since that is the case, it is obvious that we cannot kill or punish a person based on signs alone; how can we conclude that he was the murderer if we know that there are many others with that sign, so it is possible that they were the murderers.

**We only use signs to determine identity and ownership of things (and people) that were lost and found.** For example, we a person who was lost ... and we find someone dead with those signs, the law dictates that we assume that the person who was lost, is the dead person that was found, and we are not concerned that there are other people with those same signs who also died. Similarly by a lost object that was found and someone claims that he lost an object with those signs, he is believed because we assume that what was found was the object that was lost, and we are not concerned with the possibility that it is another object with those exact same signs which was also lost.

