

# ZAMHA GELATIN



## Understanding Gelatin and Its Ruling

Gelatin is a food protein derived from mammalian skin and bone. It is unique in that a dilute solution in water forms a thermally reversible elastic gel, which melts at below body temperature; hence jellies made from gelatin have a melt-in-the-mouth texture with exceptional flavour release. Gelatin is produced from two main sources of raw material, namely skin and bone. The production from bone requires that the bone be crushed, degreased and all meat removed before demineralisation using dilute hydrochloric acid to solubilize the calcium carbonate and phosphate in the bone. The residual protein matrix (collagen I) is then converted to gelatin by heating in water, filtration and ion-exchange of the resulting solution to remove contaminants, and then the solution is concentrated, gelled and dried. Finally the dry gelatin can be milled to a fineness most suited to its use i.e. fine ground for fast dissolving or coarse ground for minimal foam generation in confectionery manufacture. In the manufacture of gelatin from skin, the process depends very much on the age of the animal. For young animal hide, the hide can be simply acidified to about pH 4 and then warmed to denature the collagen, which then dissolves as gelatin. Older bovine hide requires an alkaline pretreatment to separate hair and hide to make it dissolve in hot water. After the alkaline treatment which has a marked chemical effect on the hide and causes dissolution of most of the non-collagen components, the hide is acidified and then dissolved in hot water as with young animal hide. The gelatin solution is then filtered, ion-exchanged, sterilized, concentrated, gelled and dried normally. Gelatin has a large variety of useful properties besides forming a gel with water. Its adhesive properties are used in labelling and sticking together the layers of Liquorice All-sorts. Its crystallisation control properties are used in making ice-llies and ice cream. Its film forming properties are used in making hard and soft capsules. Its foaming properties are used in the manufacture of marshmallow products and its emulsifying properties are utilised in making toffees and ice cream. Its thickening properties are used in powdered soup formulation and its water binding property is used in the manufacture of canned meats. Finally, at higher concentration it binds the ingredients of gelled confectionery into jelly-babies and a host of similar products. There are a large number of additional uses of gelatin. An example is the use in the

manufacture of yoghurt as a stabilizer. Gelatine is also used to stabilise thickened cream and low fat spreads and to clarify fruit juices.

The Ruling There are several methods mentioned in the juristic compilations by means of which impure surfaces and items may attain purity. One of the methods by virtue of which something impure attains purity is if the essence of the article/item undergoes a complete transformation. This process is termed as Tabdeel-e-Maahiyat or Qalb-e-Maahiyat in the terminology of the Fuqaha (Jurists). Examples in this regard are illustrated in the compilations of the classical jurists. Hence, if alcohol goes through a transformation and thereby turns into vinegar, it becomes pure and, therefore, consumable. Similarly, if an animal, even if it is a pig, falls into a salt pit, due to which it decomposes and consequently turns into salt then it will be permissible to consume it. Based on this principle the contemporary scholars state that if gelatine is extracted from the hides and skin of a haraam source (i.e. pork, or hides and bones of cattle which were not Islamically slaughtered) then if the raw material from which the gelatine was prepared undergoes a complete metamorphosis, it will become pure and thus consumable. Hence everyone is unanimous on the fact that if a complete metamorphosis does occur during gelatine manufacture then such gelatine will be Halaal. However, does a complete metamorphosis occur? Whilst some Ulama contend that a complete metamorphosis occurs in the process of Gelatine manufacture, thereby transforming Haraam raw material into a Halaal end product, the vast majority of the Ulama, however, are of the opinion that such required transformation does not occur and, therefore, they render gelatine derived from haraam sources to be unacceptable. Lennox Davis is one of the major gelatin manufacturing plants, which has several branches around the world such as in America, Australia, etc. One of its biggest branches is located in Krugersdorp, South Africa. Senior Muftis and Scholars have along the years visited this plant. Hence in August 1990, an Ulama group comprising of senior Muftis of the Jamiatul Ulama Transvaal had undertaken such a visit to the plant to closely inspect the Gelatine manufacture process.. Their findings were one of non-adequacy in passing a judgment of permissibility with regard to the Gelatin produced there. In the year 1997 another Ulama delegation visited the plant under the auspices of Mufti Muhammad Rafee Uthmani Saheb, the son of Hadhrat Mufti Muhammad Shafi Sahib (rahmatullahi alaih), the former grand Mufti of Pakistan. They concluded that a complete metamorphosis does not occur in the process. Similarly, Hadhrat Mufti Muhammad Taqi Uthmaani, an eminent contemporary scholar and also the son of Hadhrat Mufti Muhammad Shafi Sahib, states that he has undertaken various travels in order to acquire some verification on the Tabdeel-e-Maahiyat (transformation of skin and bones in consequence of chemical processes during gelatin production) issue and that he has personally observed the different stages of Gelatin production. Hadhrat Mufti Sahib's view is that the occurrence of Tabdeel-e-Maahiyat is questionable and unclear hence he is hesitant in issuing a positive verdict on this matter. However, if any proof of Tabdeel-e-Maahiyat does surface in the future then the consumption of gelatin made from the skin and bones of a pig would also be permissible.

No Complete Metamorphosis Occurs For the occurrence of a complete metamorphosis it is essential that the substance of the raw material undergoes a complete transformation. A partial transformation or a transformation in a few components or constituents of the haraam substance will be rendered as inadequate for it to be deemed as a metamorphosis in terms of the Shari'ah. Similarly, a mere name change does not necessarily imply that a complete metamorphosis has taken place. Hence the ascertainment of Tabdeel-e-Maahiyat is not based on a superficial change in the substance of the Haraam item. The inclusion of a haraam substance in a halaal item does not necessarily imply that the essence of the haraam substance has undergone a transformation. Only

the experts in this field would be able to determine whether a transformation occurs due to a chemical process or not. Hereunder is a summary of a report that was furnished based on the findings of the Ulama that visited the Davis gelatine Plant from which the above-mentioned aspects could be understood: In the report furnished on their findings it had surfaced that the raw material utilized in the production thereof was solely from cattle hide which after undergoing various processes including filtration, evaporation, re-filtration, drying, grinding, blending, etc the end result of which is that a fairly pure collagen is left which is the main structural material of bone and connective tissue. This structural matrix which is left remains in the form of a sticky and jelly like substance and is in turn referred to as collagen protein or gelatin protein. There is no difference at all in the molecular structure of a hide, collagen protein or gelatin protein. In essence, gelatin is already existing in the hide; the only difference is that prior to filtration and discarding of unwanted constituents, it is called collagen and after filtration, etc, it is then known as gelatin. A mere name-change does not necessarily imply that a complete metamorphosis/transformation has taken place. This was briefly their findings from which it was evident that no Qalb-e-Maahiyat takes place in the entire process. Hereunder, are some further facts based on a more secular research on this issue from which one could determine that a complete metamorphosis does not occur during gelatin production. The facts are as follows: Gelatin is a protein which is most widely obtained from collagen derived from beef or pork skin and bones. Collagen is made up of three chains of linked proteins wound together in a tight triple helix structure. A special amino acid sequence makes the tight collagen triple helix particularly stable. Every third amino acid is a GLYCINE, and many of the remaining amino acids are PROLINE or HYDROXYPROLINE. Collagen from livestock animals, like most proteins, when heated loses all structure and becomes de-natured. The triple helix unwinds and the chains separate but does not break down. A strand of collagen or Gelatin is up to 14000 molecules long. Usually the bottom, irregular shaped parts of the collagen break off and other proteins join. Denatured is not to be confused with the term "transformed". Denatured in this case is when the collagen can no longer function as collagen. But it is still collagen. Hence the term is denatured and not transformed. For all molecules its shape is very important to its function and if it loses its shape it will lose its function but not its Substance. When this denatured collagen cools down, it soaks up all the surrounding water and re-wounds the chains in a right-handed helix, forming GELATIN.

Some Facts: Gelatin is composed of 21.4% of GLYCINE. Collagen had 33% GLYCINE.

Gelatin is also composed of 12.4% of PROLINE. Collagen had 24% of PROLINE.

21% of Gelatin is GLYCINE, left over from Collagen. It isn't newly formed or created. From the above, it could be said that at least 20% of the original Collagen still exists. If you add the 12% of PROLINE that would leave us with at least 30% of the original Collagen still existing in the Gelatin. And this is besides all the other Amino Acids which were part of the Collagen strands and which also forms part of the Gelatin like ALANINE (9%), HYDROXYPROLINE (11.9%), LYCINE (3.5%), and others. Hence, a total transformation would require the Amino Acid to break down into constituent elements but if it only rearranges at the Amino Acid level, there is no total transformation. An example of something that undergoes a total transformation is that of soap. Soap is usually made from the fat of animals. It is composed of three elements; Carbon, Oxygen and Hydrogen combined in a complex form. When you add Sodium Hydroxide to it you get a break down and transformation into Glyceryl. Based on the aforementioned findings of the Ulama and experts one can clearly determine that a complete metamorphosis does not occur during gelatine

production since there is still part of the original animal still remaining after the formation of the end product, which is Gelatine. Hence, the final ruling on Gelatine would be:

If it is manufactured from a Halâl source then there is permissibility in its usage, whilst if the source is Harâm or Mashqûk [doubtful] then it will be treated as Harâm.