HOW CAN YOU TELL IF A K2-7 PRODUCT IS SYNTHETIC:

Although it is difficult to test for isomers, it is not difficult to see if a particular vitamin K2-7 product is made from natto fermentation. Bacillus produces 2 forms of K2 during fermentation: K2-7 and some small amount of K2-6. Bacteria never produce K2-3, K2-4 or K2-5. Natto bacteria, in natural fermentation only produce measurable amounts of K2-6 and mostly K2-7. This is well documented. In the food natto, you will not find K2-3, K2-4 or K2-5.

Thus, one way to tell if a product has some synthetic K2 in it is by simply looking at the chromatogram that is produced against a K2-7 standard. If it is made from natto fermentation in a purely natural way, you will find one very small peak for K2-6 and the major peak for K2-7. If it has some or all synthetic product, it will show several low level peaks that can be identified as other forms of K2; i.e. K2-3, K2-4 and K2-5. The reason for this is how synthetic K2 is made. K2 has the main naphthoquinone rings and the isopryl sub units are attached to it to give 6 for K2-6 or 7 for K2-7. When synthesizing however, they produce the naphthoquinone ring then add on the sub-unit side chains chemically to make it K2'. The problem is that the addition of the side chains chemically is not 100% specific and thus you get K2-3, K2-4 and K2-5 also forming among K2-6 and K2-7.

There are 3 chromatograms that follow:

The first chromatogram is from the European Food Safety Authority publication of a true, natural product that is natural K2-7 made from natto fermentation, we have verified this in our testing. You will notice a fairly flat line with a very minor K2-6 peak and a major K2-7 peak. This format is the natural K2 fingerprint.

The second chromatogram is that of SeeBio's material (likely the product Vesta if offering); you will see that it contains several minor peaks and looks quite different from the PL Thomas material. This is indicative of material that has some, if not all, synthetic material in it.

The final chromatogram is of our material, MenaquinGold. As you will see, it has the same shape and format, where there is a minor K2-6 peak and then a major K2-7 peak.

Products from natural fermentation have the same fingerprint, the product that is suspected of having synthetic material in it, has a completely different fingerprint. You will also find some natural fermentation products that have many unidentified peaks, these products are considered to have a very high background of contaminants.
Chromatogram of EFSA registered material from natto fermentation. Between Time 3 and 8, you see a relatively flat line with a very small peak around 6.780 for vitamin K2-6. This is a signature of natural fermentation K2.

K2-7 Peak

K2-6
Seebio (Chinese manufacturer); this product is believed to be synthetic and has been analyzed by several labs. Unlike the natural fermentation product, you see several measurable peaks between 3 and 8 time. There are at least 4 such peaks and represent different forms of K2 that are made during the chemical synthesis productions.
MenaquinGold - Viridis material. Natural vitamin K2 and has the same signature of a natural K2. Between 3 and 8, there is only 1 peak representing vitamin K2-6. This is also seen in the natural Japanese product.