

## **Natural gut, the king of all strings**

Natural gut has been regarded as the premiere tennis string since the early 1800s. It has been, and remains, the most frequently used string on the pro tour. The history of natural gut tennis string dates back almost to the beginning of tennis itself - the first set of natural gut tennis string was manufactured by Pierre Babolat in 1875. Fifty years later, Babolat would launch VS Brand Gut. Seventy-eight years later, VS Brand Gut continues to be one of the most recognized brands of natural gut.

There has been a constant development of synthetic strings since shortly after natural gut found its way into a tennis racquet. With each advancement in technology comes a new string that the manufacturer claims will "play more like gut" than its predecessor. However, for the tennis purist natural gut remains king. Yes, some may argue that natural gut costs more than a multifilament synthetic, but to many players the performance more than justifies the expense.

### **What is natural gut?**

Contrary to some beliefs, the source of natural gut tennis string is the cow. Well, not the whole cow, just a part of its intestine called the serosa. Any sheep or cat reading this that may have heard tennis strings referred to as sheep gut or cat gut can breathe a sigh of relief. The reason for the common misconception that gut string was made from cats has a few different theories. One such theory, according to Babolat, is that in the Middle Ages Welsh Troubadours played an instrument that sounded like a cat meowing. The English called this instrument a cat and its string was called cat gut. When natural gut strings made their way into tennis racquets the 'cat gut' name stuck. So even though natural gut tennis string is at times referred to as catgut, cats never were a source for racquet strings.

Sheep, on the other hand, weren't so lucky. Sheep were, in fact, an original source of tennis strings. However, over the years a number of contributing factors have taken sheep out of the picture. According to PACIFIC, a natural gut manufacturer based in New Zealand, the use of sheep gut is not practical for a few basic reasons. One reason is that the use of sheep gut would place string manufactures in competition with the sausage industry, which uses that same part of the intestine to produce the skins for breakfast links. Another reason is that the tensile strength and length of sheep gut doesn't lend itself well to today's tennis game. Today's larger, stiffer racquets require not only more string, but string with greater tensile strength.

Fortunately for tennis players, the serosa from a cow's intestine fits the bill nicely. A cow's serosa has a greater tensile strength than sheep gut and it is also longer. However, the serosa is only a small part of the intestine and it takes about three cows to produce one set of tennis string.

So, if you are going to manufacture natural gut tennis string you need a good source of beef serosa - which the food industry provides. However, not just any old cow will do if you want to produce high quality string. Being a natural substance, natural gut from cows can vary in its performance and quality not only from breed to breed, but also from region to region.

According to PACIFIC, who manufactures all of its natural gut strings in New Zealand, gut from the Taranaki region has proven to be stronger than gut from the Auckland region. Why is this? Do cows in one area live better than those in another? Maybe the traffic out to the pasture in Auckland can be a real cow. Maybe these city heifers are feeling it in the gut. PACIFIC has launched a study to find out the reason for the differences, but in the meantime they are using only the highest quality serosa from Taranaki cows.

Another theory is that breeds of cows raised in pastures have tougher intestines compared to corn fed cows due to the ingestion of the occasional rock and dirt from the field. The belief is that the intestinal material is stronger in order to deal with these impurities.

Do cows raised in climates that produce lush pastures produce better natural gut? Some manufacturers believe so, and buy their serosa from specific sources in an attempt to maintain a consistent quality.

### **What makes natural gut so special?**

The structural design of natural gut makes it unique and gives it superior performance qualities for a tennis string. The collagen found in serosa has a molecular make-up that is designed to withstand the stretching and contraction of the intestine. Collagen is a major fibrous component of many types of connective tissue and it is the elasticity of the material that makes it a good source for tennis string. The collagen in the serosa is made up of a triple helix molecular structure. A triple helix features three bands of ribbons that are braided in a rope like fashion. The braided formation of the helix not only provides good elasticity; it also manages to provide a cushioning aspect to the material. The result is that a natural gut tennis string not only offers good power and elasticity when at tension in a racquet, but it is also very easy on the arm.

According to Rod Cross' article in ["The Physics and Technology of Tennis"](#) natural gut, when strung at tensions above 50lbs, will result in a softer impact than a nylon tennis string. By testing equal lengths of string in a laboratory, Cross showed that nylon increases in tension more than natural gut when a player strikes the ball. Therefore, a racquet strung with nylon will play with a stiffer and less forgiving stringbed than one strung with natural gut. With less tension increase natural gut will be more forgiving in play, placing less stress on a player's arm and shoulder. The cushioning aspects that are built into the molecular structure of natural gut makes it the most arm friendly string available, and it is often recommended for players suffering from tennis elbow.

The fact that natural gut plays softer than synthetic strings creates another advantage in the playability characteristics of natural gut. What players call 'ball pocketing' - a sense of prolonged dwell time of the ball on the strings - leads to a greater sense of control when playing with natural gut. Many players like the feel of natural gut because they feel more connected to what is happening with the ball as it impacts the stringbed.

Natural gut is also better than synthetic strings at holding tension. Do you like that fresh strung feeling? You'll get to enjoy it longer with natural gut in your racquet. Here the appeal to professional players becomes more obvious. When professional players break a gut string they can reach for a new racquet and be confident that it will play and feel similar to the one they were just using.

Because it maintains tension so well, natural gut will continue to offer its superior playability characteristics for the duration of its life. Players who do not frequently break strings may find natural gut to be a better value than synthetic strings. Rather than having to cut out and replace 'bagged-out' synthetic strings, a player using natural gut can continue to benefit from the playability of the string until it breaks.

The durability of natural gut has come under question from modern strikers of the ball. Although natural gut isn't as durable as polyester or Kevlar strings, it is comparable to most performance synthetics.

### **Soggy when wet**

Back in the day, getting natural gut wet could mean ruining a good string job. This was a bigger concern for players living in areas with a humid climate, where moisture in the air could penetrate the string and adversely affect its playability. However, today's natural gut strings are coated with a protective layer to prevent water and weather damage.

Even players who are hard on their strings can prolong the life of natural gut to get good value from the string. Several manufacturers recommend players in humid climates apply wax to their strings between usage. As well as keeping moisture out, cleaning the strings down with a cloth and rubbing wax on the stringbed prolongs string life by reducing friction and notching between strings. During play on clay, and even hard courts, dirt and grit lodged between the strings can increase friction. Friction creates notches on the surface of the string, leading to premature breakage. A little care taken to keep the strings waxed-up and grit free will lead to a much longer string life.

Natural gut manufacturers continue to improve their production processes in an effort to increase durability. For instance, Babolat currently uses a high-temperature finishing process in its Thermogut line of strings. The Thermogut treatment is designed to increase the cohesion of the string's fibers all the way down to the core.

### **From the cow to the racquet**

Natural Gut string production is an involved, hands on process. Once the beef serosa has been removed from the animal it is cut into long ribbons. The ribbons then go through a long, wet cleaning process. How the ribbons are cleaned and prepared can vary by manufacturer, but the ribbons are basically subjected to a variety of baths. The goal is to gently remove impurities without harming the collagen. The string may be bleached at this time to remove some of the orange color from the ribbons.

Once the serosa ribbons have been washed, and any impurities removed, they are subjected to another round of quality control. At this time, a manufacturer may also add some color to the string if desired. The ribbons are then bound together on tension racks and the drying process begins. The drying process is carefully controlled, with most manufacturers using a specially designed climate controlled room to insure consistency. The drying process can take several days.

Bound together and at tension the ribbons finally start to look like string. However, at this stage the outer surface of the string is rough and must be polished for smoothness. It is then checked to make sure it meets the correct gauge specifications. At this point in the process most manufacturers will conduct another quality control check and coat the string with a special polyurethane coating to improve abrasion and water resistance. Finally, the string is prepared for packaging.

As you can see, producing one set of natural gut string is a long and involved process. Obviously, the greater the attention to detail and quality control employed during the production process the greater the quality and consistency of the finished product.

### **It might be natural, but it's not all the same**

Natural gut can vary greatly in quality and playability from manufacturer to manufacturer. The natural gut carried here at Tennis Warehouse represents a selection of the natural gut available from the most established natural gut manufacturers in the industry. As you now know, the production of natural gut is labor intensive. Changes in the production process of the string can alter its stringability, feel, playability and durability.

Premium natural gut consists of only the best natural material and must meet the strict guidelines of the manufacturer. Since premium natural gut commands a premium price most manufacturers also produce a second line of strings which may have slight inconsistencies in gauge and color. Such is the case with Babolat, with its premium VS Team line of strings and its Tonic+ line of strings. Although Babolats Tonic+ is a high quality natural gut, it does not meet the exact gauge and cosmetic requirements of VS Team, which is regarded by many as the ultimate in natural gut.

### **Natural gut at Tennis Warehouse**

At Tennis Warehouse we offer an extensive selection of natural gut tennis strings to meet the needs and budget of every tennis player. Check out our current selection of [natural gut strings](#).

Article date: Sept, 2003. If you found this review interesting or have further questions or comments please [contact us](#).

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