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Last Modified: December 1998

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I. Introductions

There's been a jump in recent years in the popularity of serrated edges, and there's often confusion as to when a serrated edge is advantageous, versus when a plain edge is advantageous. The question comes up often in rec.knives.

For our discussion, we'll need to talk about what we're doing with the knife. Think about what you can do with a knife: you can shave, slice, slash, saw, hack, chop, etc. For our purposes, we'll divide all knife uses into two very broad categories:

Push cuts: The main cutting is done by pushing the edge through the thing-to-be-cut. For example, when you shave, you push the edge of the knife through your beard. When peeling an apple, you push the edge under the skin of the apple. When chopping wood, you try to push the edge into and through the wood.

Slicing cuts: The cutting action is substantially done by dragging the edge across the thing-to-be-cut. When you slice meat or a tomato, you drag the edge across the tomato as you cut through it. Slicing and sawing are examples of slicing cuts.

II. Plain vs. Serrated: The Conventional View

In general, the plain edge is better than the serrated when the application involves push cuts. Also, the plain edge is superior when extreme control, accuracy, and clean cuts are necessary, regardless of whether or not the job is push cuts or slices.

In general, the serrated edge will work better than the plain edge for slicing cuts, especially through hard or tough surfaces, where the serrations tend to grab and cut the surface easily. Some of the cutting power of the serrated edge is due to its format alone; thus, even a dull serrated knife will often perform competently at slicing jobs. The serrated edge gets its slicing ability from a number of factors. The high points on the serrations will touch the material first, and this gives those points higher pressure per area than if the same pressure was applied to a plain blade; this allows the serration to puncture more easily. In addition, serrations are normally chisel-ground into the blade, which means they are thinner (and thus cut better) than the comparable plain blade.

The plain edge will work better for applications like shaving, skinning an apple, skinning a deer. All those applications involve

either mostly push cuts, or the need for extreme control. Serrations work really well on things like tough rope or wood, where the serrations bite through quickly.

Generally, the more push cuts are used, the more necessary it is for the plain edge to have a "razor polished" edge. A knife edge becomes more polished when you move to higher and higher grit stones. Generally, 1200-grit is considered polished; a 6000+ grit Japanese water stone would polish the edge further.

One interesting case is cutting a tomato. In theory, you can just push a blade through a tomato, so a razor polished plain edge would work fine. However, the tomato is soft, and unless your plain edge knife is very sharp, the tomato will simply squish when you start pushing. You can (and many people do) use a slicing motion with your plain blade, but if it's even a little dull it won't cut well and it may not even break the skin. Use a sawing motion with a serrated knife (even a dull one), and your tomato will slice fine.

You will read about test after test where the above view is confirmed. That is, the plain edge excels in push cuts, and the serrated excels in slicing cuts. This confirms the conventional view ... to an extent.

III. Plain vs. Serrated Re-thought

Since actual tests confirm the truth of the conventional view, what more is there to be said? The problem is that the tests are often not as thorough as they need to be. That is, when testing plain vs. serrated performance, most tests are comparing a plain polished edge to a serrated edge. Given that, it is no surprise that the serrated blade easily outperforms the plain blade when cutting (for example) rope.

A polished edge is not the only choice with a plain blade. One can get the plain edge to perform much differently when sharpened with coarser stone. People who cut rope often use a plain edge sharpened on a file, to get an incredibly coarse, "micro-serrated" edge that performs wonderfully at slicing jobs. So the knife testers are testing with polished plain edges, whereas people experienced with cutting rope use coarsely-ground plain edges.

Whether or not serrated blades will out-slice coarse-ground plain blades seems to depend on the medium being cut. Harder materials (or materials under tension) do well for serrated blades. With softer materials, the serrations will sometimes catch and unwind the material rather than cut -- in this case, coarse-ground plain blades may easily out-slice serrated blades.

So the claim that serrated edges work better than plain edges for slicing needs to be re-examined. It appears that as materials get harder or put under more tension, the serrated edge may slice a bit better than a coarse-ground plain edge. As the material gets softer and looser, the coarse-ground plain edge may slice a bit better. And as we go towards push cuts, the polished plain edge comes into its own. The user may want to experiment on those materials that he often cuts, before choosing the edge format.

In addition, keep in mind that the coarse plain edge is much easier to sharpen than the serrated edge. Just grab your file or extra coarse stone, take a few swipes, and you're ready to go. With the serrated blade, you'll need to find a sharpening rig with the special serrated blade sharpener. Balancing this is the fact that serrated blades need to be sharpened less often.

IV. What Should I Carry?

Should you carry a serrated blade or plain blade for everyday utility carry? Unless you *know* that the majority of work you'll be doing heavily favors slicing or pushing (e.g., "I spend all my time whittling"), it may not matter much. My experience has been that general utility work is usually general enough that either format works just fine, though these days I tend to lean towards plain blades. Also keep in mind that by changing your sharpening strategy on the plain edge, you can significantly change its characteristics. If you do a lot of push cutting, you want to go with a razor polished plain edge. If you do a lot of slicing, you'll need to decide between a coarse-ground plain edge and a serrated edge. I don't mind sharpening, so I lean towards plain blades, strategically sharpened to the right grit (polished or coarse) for the jobs I happen to be doing.

Occasionally, people mention that the serrated edge looks intimidating to the masses. This could be good if you're using this knife primarily for self defense and want an intimidation factor. Or it could be bad, if you're carrying for utility work and don't want to scare people (especially the nice officer who pulled you over for speeding and asks to look at the knife in your sheath). Rumor has it that airport guards are particularly strict about serrated edges. Other than at airports, I don't think the menacing appearance of the serrated edge is important enough either way to affect what I carry.

V. Thoughts On The Partially-Serrated Blade

Another option is the combination plain/serrated edge. This format appears to have overtaken the all-serrated format. Typically, the 50%-60% of the blade nearest the tip is plain, while the back 40%-50% is serrated. There are mixed feelings on this format. Many people swear by this format, and feel that it is a good compromise, giving the user the choice of precise push cuts from the plain edge, and the advantage of the serrated edge for tougher materials. However, keep in mind that on a 3.25" blade, there's maybe 1.25" of serrations. The detractors of this format feel that 1.25" is too short a length for the serrations to be really be useful, and the length of the plain edge is being sacrificed for no good gain.

My own philosophy on partially-serrated blades at the moment is that since I have both edge formats in one knife, I try to let each one shine in their respective areas. So I'm razor polishing the plain edge part, often on a 1200 grit diamond stone or even 6000 grit Japanese water stone, and then stropping it. The plain edge is scary sharp for push cuts, and I use the serrations when I need to cut through hard or fibrous material.

Partially-serrated blades are often serrated at the "wrong" place.

For example, for camp use, I might want the belly serrated for cutting my steak, and the part near the handle razor-polished for whittling and control-type usage. However, 99.9% of partially-serrated blades are ground exactly the opposite: the ripping inaccurate serrations are at the control part of the blade, and the plain part is out at the slicing part.

In theory, one can use a plain blade to get similar performance to a partially-serrated blade. Just razor polish the plain blade, and then rough up one part of the edge on a file, to get a knife that will excel at push cuts at one point of the blade, and excel at slicing cuts at another.