By Ron Spomer

Killing the Energy-Killing Myth

I read a recent "Best Cartridges To Hunt Elk" blog that advised, and I paraphrase, "Most effective elk cartridges need to be flat-shooting and hit with enough energy to effectively dispatch a big bull."

And that's a lot of bull.

Because energy doesn't kill.

A big, tough animal like this 800-pound bull elk requires a LOT of bullet energy to kill, right? Wrong.

The Myth of Killing-Energy

"Killing-energy" is one of the biggest myths, or at least misconceptions, in hunting. But a profitable one. Belief in it has led to new cartridges, bullets, and rifles year after year for decade after decade.

Ill advised, yet successful extreme-range shooting with anemic rounds like 6.5 Creedmoor have poked some holes in the killing-energy theory, but hardly killed it. Nor will this article. But by reading it you might get a better understanding of what goes on when you throw a small stone at high speed into the thoracic cavity of an elk. Or mule deer. Or buffalo. Or… any other game including jackrabbits.

Where do you draw the line? Which of these centerfires is finally powerful enough to kill an elk? And which bounces off? I'll bet dollars to donuts the 243 Winchester (third from left) has terminated more elk than the 338 Lapua Magnum (2nd from right) and 470 Nitro Express combined.

Actions and Reactions

We'll begin with (and should probably end with) the unimpeachable Sir Isaac Newton's third law of motion: For every action there is an equal and opposite reaction. The quantity of energy in a bullet sent toward your game is the same as the energy sent back into the rifle — and your shoulder behind that rifle. So, if the energy in the recoiling rifle didn't instantly kill you, how can the energy in the bullet instantly kill your target animal of the same or larger size? You absorbed all that energy. Why aren't you dead?

This shooter just absorbed 65 foot-pounds of recoil energy from a 416 Rigby throwing a massive 400 grain bullet. If energy kills, why is he still standing?

Hemorrhaging, Not Squashing

The obvious answer is that the rifle didn't break your skin, tear your aorta, or perforate your lungs. The bullet probably did that to your deer or elk. If the bullet tears the proper vital organs and enough of them, the animal will die. But not from massive energy. From massive blood loss.

That this occurs is proven by misplaced shots that strike, say, the paunch or rump. Or even the shoulder without penetrating to the vital organs beyond. The target animal absorbs all the energy carried by the bullet, yet isn't killed by that energy.

If the bullet breaks enough support structure — for example a leg bone — the beast may fall, but odds are it will not be instantly killed. More likely it will scramble up and run off three-legged, sometimes surviving to the next hunting season, unimpressed by all that killing-energy of the "best cartridge" you used to wound it.

If energy kills surely this whitetail would have been flattened by the 7mm Rem. Mag. that just hit it with 3,200 f-p energy. You can see by the dust and hair in the air behind its rump that it's leaped forward already and is still on its feet. That buck went on to dash about 80 yards before fainting from low blood pressure, then expiring from severe hemorrhaging causing brain cells to die.

Then Why Those Dramatic DRT Responses?

All of us have seen and probably caused what appear to be pretty dramatic "dead right there" hits on large game. If that's not killing-energy, what is it? Most likely a central nervous system strike. Hit the brain and/or spinal column forward of the withers (above the shoulders) and most game is killed instantly. Unplugged, as we used to say.

In contrast, strike that same animal with that same bullet behind the withers, and it will lose motor control behind that point, but not killed outright. Broken back. Same bullet, same energy on target, but dramatically different results. Broken back in front of the shoulders and instant death. Broken behind with the same bullet, same energy — and just paralyzed behind that wound. Why? Because energy alone doesn't kill. It has to be applied to the right place. And then not much is required.

Additional proof of this comes from 22 rimfires and 45-pound-pull bows flinging target arrows. Park a measly 40-grain 22 slug with 100 f-p energy in the spinal column of the neck of an elk and it's as dead as if hit with a 300-grain solid from a 375 H&H Magnum carrying 3,700 f-p energy. Drive a target arrow into that same spinal column and you'll get the same results. Obviously very little energy is needed to instantly terminate even large game if that energy is applied to the proper place.

A puny 60-grain .224 bullet carrying just 1,300 f-p energy killed this buck instantly by breaking its shoulder, then its spine, then its hip before continuing into the prairie beyond, "wasting" some of its energy. I'll take placement over energy every time.

Launching Deer

What about all those deer that hunters have reported flipping over or blowing ten feet backward after solid, bone smashing hits from super magnums? Is that not an example of killing energy? No, it is not. More likely it's muscular reactions to the impact. The animal leaped. Again, Newton's law. If the shot didn't knock you over, how the heck is the bullet — which has lost considerable energy during its flight downrange — going to have the power to flip an equally heavy or heavier animal into the air? Or push it back ten inches let alone ten feet?

Some of the misconception about this might be the fault of our kinetic energy measurement. A projectile's kinetic energy (energy in motion) is a product of its weight and velocity. Doubling weight doubles energy. Doubling velocity quadruples energy. This is why 50-caliber blackpowder big game cartridges pushing 400-grain bullets 1,600 fps back in 1880 have been superseded by 7mms pushing 150-grain bullets 3,200 fps in 2021. The high velocity 7mm delivers more energy. (3,411 f-p for the 7mm vs. 2,274 f-p for the 50-caliber.) Most bottlenecked, smokeless-powder cartridges of about 25-caliber and larger throwing 120-grain bullets and heavier deliver more energy at 100 yards than do most the heavy, slow bullets of yesteryear.

To fully appreciate this we should define what kinetic energy in foot-pounds means: a foot-pound of energy is enough to, theoretically, raise one pound of weight one foot off the ground. A bullet carrying 3,000 foot-pounds of energy, then, should push a 100-pound pronghorn or whitetail doe a good 30 feet, right?

Wrong. I know because I've tested the theory hundreds of times. I've hit 30-pound coyotes with bullets packing 3,000 f-p energy and blew them exactly nowhere. They collapsed in their tracks in the snow. The bullet stayed inside, too, so the little coyote absorbed all that killing-energy. But got pushed not so much as an inch. Another coyote took a 180-grain bullet from a 300 Win. Mag. to the chest and dashed a good 30 yards before collapsing from massive hemorrhaging.

Let's Be Honest

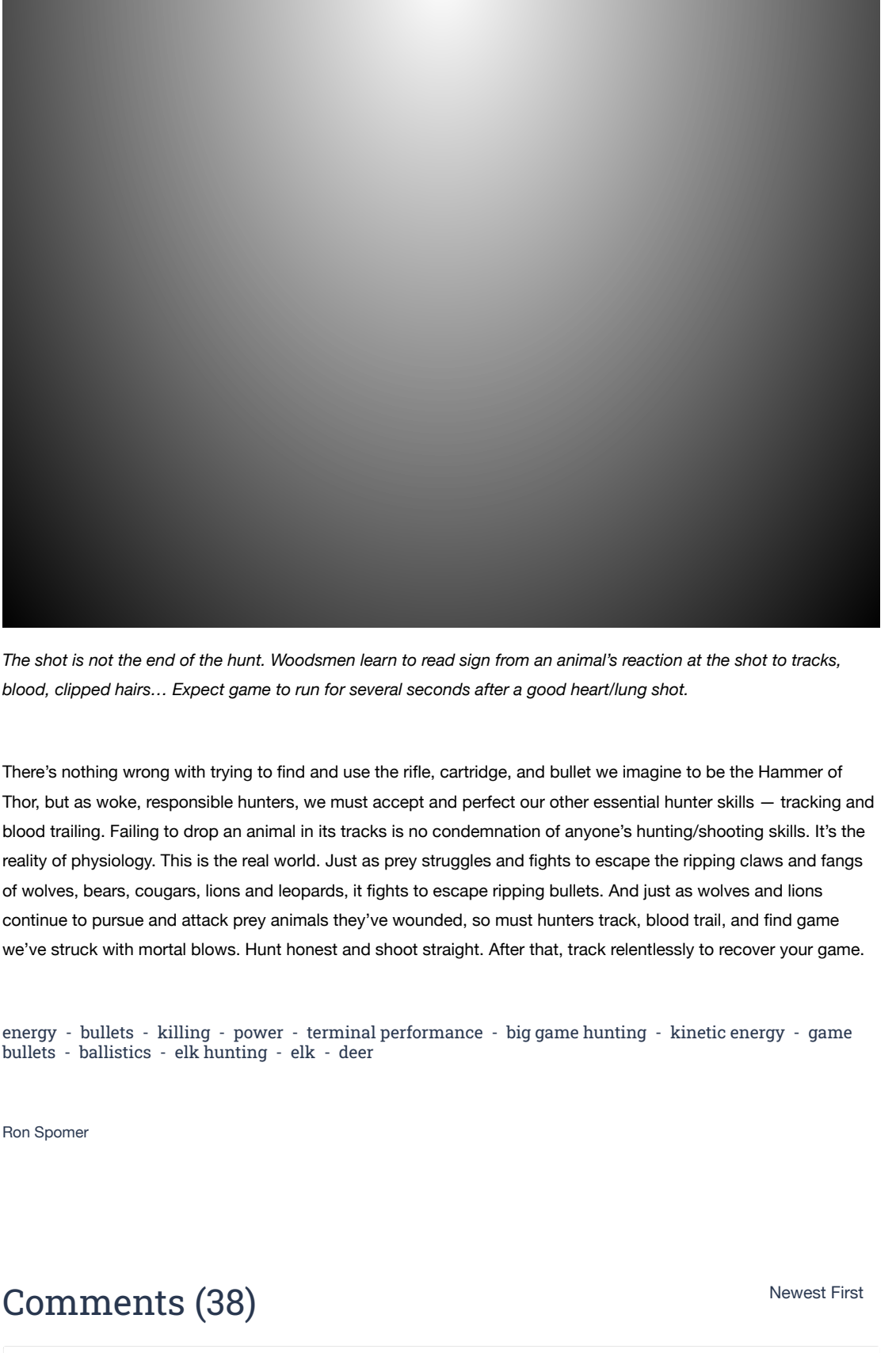
Honestly, bullet energy matters. A little. Our problem is conceptual. We marry our misconceptions to macho myths about massive metallic muscle powered by piles and piles of powder. Our rifles kick and roar. Surely these fire-breathing dragons have the power to deliver an instant death blow, right? Not necessarily.

Much as we'd like to believe we are wielding the Hammer of Thor, we're really just throwing glorified stones fast enough to penetrate to vital organs and break them down. Regardless their diameter and mass, our bullets are just bits of ripping and tearing metal engineered to render vital, life supporting organs ineffective. When the cardio-pulmonary system can no longer deliver richly oxygenated blood to the brain, it fails. Blood pressure drops. The animal gets dizzy. Loses consciousness. Dies. This takes several seconds, perhaps minutes depending on the degree of hemorrhaging. During that time the animal retains function to stand, walk, run, forage, fight, mate… I've seen it all. Including expiring on the spot, instantly. Whether hit with a 55-grain bullet or 500-grain.

Surely the massive energy of a 375 H&H, 458 Win. Mag., or 458 Lott will kill a deer instantly every time, right? Don't count on it. I've seen half-grown whitetails take a 50-caliber through the chest and run 25 yards before falling.

Yes, sometimes some combination of bullet energy, where it lands, the target animal's heart beat, blood pressure, adrenaline, and the phase of the moon combine for an instant kill. But let's not fool ourselves. This wasn't killing energy. If it were it would work nearly every time.

Be A Complete Hunter



The shot is not the end of the hunt. Woodsmen learn to read sign from an animal's reaction at the shot to tracks, blood, clipped hairs… Expect game to run for several seconds after a good heart/lung shot.

There's nothing wrong with trying to find and use the rifle, cartridge, and bullet we imagine to be the Hammer of Thor, but as woke, responsible hunters, we must accept and perfect our other essential hunter skills — tracking and blood trailing. Failing to drop an animal in its tracks is no condemnation of anyone's hunting/shooting skills. It's the reality of physiology. This is the real world. Just as prey struggles and fights to escape the ripping claws and fangs of wolves, bears, cougars, lions and leopards, it fights to escape ripping bullets. And just as wolves and lions continue to pursue and attack prey animals they've wounded, so must hunters track, blood trail, and find game we've struck with mortal blows. Hunt honest and shoot straight. After that, track relentlessly to recover your game.

energy · bullets · killing · power · terminal performance · big game hunting · kinetic energy · game bullets · ballistics · elk hunting · elk · deer

Ron Spomer

Comments (38)

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David Copeland 2 months ago · 0 Likes

Assuming you are correct and energy really isn't that important to killing an animal, if you were to go hunting in AK for moose or brown bear, which caliber would you be comfortable using? Would you consider 300 prc overkill?

Copeland1996 2 months ago · 0 Likes

If you were to go hunting for moose or a large brown bear, what caliber would you suggest? Because if energy isn't that important, is using a 300 prc or other large 30 caliber weapon simply overkill? I completely agree that shot placement is the most important aspect to getting a clean kill, but I am curious what caliber you would be comfortable hunting moose with in bear country?

Ron Spomer 2 months ago · 0 Likes

David, with a tough enough bullet and competent shooter, any 300 magnum such as the PRC would be fine, but so would a 30 caliber with the same bullet and slightly less velocity because, as so many hunters have observed, the right bullet in the right place merely needs enough kinetic energy to penetrate hair, hide, muscle and bone to reach the vitals and rear them. Brain or spine shot, a hard bullet from a 30-30 will suffice, but at MV 2300 fps, that might not have enough energy to reach both lungs from certain angles. Give it 30-06 MV or 300 Win Mag MV and your odds improve. Having shot just one grizzly and one brown bear myself, I'm no expert, but if career bear guides like Phil Shoemaker say 270 Win and 30-06 do the job, I won't argue. I've seen a wide variety of game as light as 100 pounds and heavy as 1,800 pounds absorb hits from large calibers packing massive energy and dash away as if merely frightened. After several seconds they "run out of gas" and fall. If a 100-pound reedbuck shot through the chest with a 300-gr bullet carrying 4,000 f-p energy skips away as if missed, I fail to see how that same load or one lighter, like the 300 PRC, will slam it to the ground. Yes, we all love the idea of a bigger, faster bullet, but expecting this to stop a charging bear or even coyote without hitting central nervous system or structural support bones is wishful thinking. All this said, I would choose any larger caliber I could carry and chamber and whip into action easily/quickly and load it with any bullet designed to stay in one piece, penetrate in a straight line, and carry enough energy to reach (and ideally shoot through) a bear's vitals from any angle. That will more than suffice for moose. I took most of my moose with 30-06 and various 7mms using 150- to 200-gr. bullets.

Hunter Van V. 8 months ago · 0 Likes

Interesting take on the subject, and it clears up a misconception. It's further reinforced by the minimum requirement for killing deer with a bow, 25 ft-lbs(!). It's the sharp edges of the broadhead severing blood vessels that get it done, not the KE.

TCL 9 months ago · 1 Like

woke?

Jeff S. 10 months ago · 0 Likes

My son and I have killed about 10 whitetails with a 300 AAC Blackout and 194 grain Lehigh Maximum Expansion bullets that are traveling at subsonic velocity. At 75 yards that bullet only has about 450 ft/lbs of kinetic energy, but it's designed to expand like a broadhead at low velocity and causes massive hemorrhaging. We had one run maybe 100 yards after a high lung shot, but the rest have only made it 30-50 yards on average before expiring. The combination of subsonic, suppressed, low velocity ammunition is not only incredibly pleasant to shoot without hearing protection, but it's plenty lethal. It's range limited due to its dramatic drop beyond 100 yards, but it absolutely proves that kinetic energy doesn't equate to lethality.

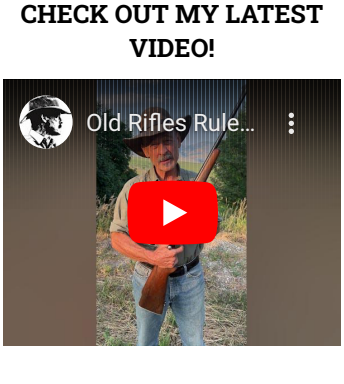
Jim L. A year ago · 0 Likes

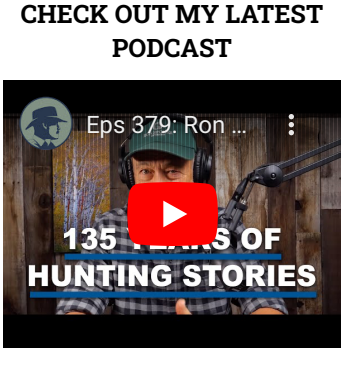
Great article, Ron. I understand that energy doesn't kill, per se, but it's hard to let go. I've got a 7mm-08 and, despite what some might say, with Barnes bullets I would consider it sufficient for moose. I'm looking at a handy Win 94 in 38-55. The energy figures aren't even close. Could I count on it within its 190 yard MPBR on the larger animals due to the heavy bullet and larger diameter?

Ron Spomer A year ago · 0 Likes

Yes, or course, Jim. As northern homesteaders have proven for 100 years, you can put up your winter moose supply with a properly applied 22 Long Rifle. These days they're more likely to use a 223 Rem. in an AR-15. As a general rule, long, wider, heavy bullets with lower impact energies rely on momentum for deep penetration. So long as you hit and tear enough heart/lung tissue and cause sufficient hemorrhaging, you'll get your moose. Usually takes them a minute or three to realize they're dead is all.

An 2 years ago · 0 Likes





Case in point(kind of): David killed Goliath with the right placement using a rock and sling. One can never go wrong reading Ron's experience. Happy New Year all !

Travis Thams 2 years ago · 0 Likes

You're right and wrong. Any bullet that can make a hole will eventually kill an elk or any animal. However, transfer of energy is what effectively and humanly kills the target. The ability of the ammunition to transfer its energy to the targets soft tissue and vital organs is what effectively and humanly makes the lights go out.

If your ammunition penetrates and fails to transfer its energy (dump its energy) will penetrate extremely deep. However, a long hole the width of a .30 cal or even .45 cal bullet will not humanly turn the lights out.

Energy transfer is the most important element in making an effective kill.

Ballistics and the physics of remain constant! The platform, ammunition or game can not change this.

Ron Spomer 2 years ago · 0 Likes

Travis, I've seen evidence supporting your contention that physics remain constant, but respectfully take exception with your other claims. First, not every bullet that makes a hole eventually kill an elk or any animal. In many cases the hole closes, heals, and the animal lives. Ballistics change based on MV, B.C., temperature, elevation, winds, distance from equator, elevation, etc. But I think you're meaning is that the basics of ballistics remain constant, i.e. we use the above parameters to calculate trajectory, so I'm being somewhat facetious with that one. No, my real disagreement with your contention involves that energy transfer point. In my experience its not transferring the energy that kills so much as the bullet's ripping, cutting, tearing vital organs. The exception is when said bullet strikes central nervous system. And in that case something as weak as a 29-grain 22 Short will suffice. As elephant hunters/cullers with vast experience have learned, miss an elephant's brain by an inch and it doesn't matter if your bullet is Bell's 173-gr. 275 Rigby or a 500-gr. solid from a 470 Nitro Express. The elephant won't die. As Pondoro Taylor detailed with his TKO formulae, it will be knocked unconscious for a variable period, but then recover and depart. Now, we could say that those bullets missed vital organs, which is true, but their energy did not. Those bullets remain in the skull, they radiated incredible quantities of energy to the brain, the most vital organ of all, yet... I can regale you with anecdotes of animal after animal absorbing hits from 300 magnums, 7mm magnums, 54-cal muzzleloaders, 45-70s, etc. and not only running off, but requiring additional shots even though the first one or two didn't exit. Another way to think of this is the gut shot that never exits, yet doesn't kill for hours, sometimes days. All the energy is absorbed by the animal... Better example might be the broadhead. Virtually no energy, yet remarkably quick death due to hemorrhaging. I think I know what you mean by massive bullet energy breaking vital organs like heart, lungs, liver, Travis. But in autopsy after autopsy I've seen that tissues in the secondary wound channel (the broader area impacted by the energy transfer but untouched by the actual bullet or parts thereof) appear undamaged. I credit tissue elasticity with this, and I think you can easily understand this. Even in a ballistic gel block we see the radiating waves of energy transferring through the block, but when the bullet has stopped or passed through, the temporary wound cavity remains nearly undetectable, the only torn gelatin where the bullet has touched it. We might also consider human boxers. They take body blow after body blow, even face/head shots and don't go down. On rare occasions a particular blow tears liver, kidney, etc. I've read that Rocky Marciano's punch was measured at 2,000 foot pounds. That's about what a 100-gr. 243 Win. carries at the muzzle, het we know a hit from that will be a lot more likely to kill than any boxer's blow because the bullet will tear vital tissue whether all it's energy stays inside or some passes out with the bullet exiting. Anyway, that's how I analyze this stuff, Travis. Whether you and I agree or not doesn't matter much so long as each of us uses the cartridge/bullet we think most effective and then in such a way that is it effective! Here's wishing you quick, clean kills every time and joy in all your outdoor pursuits. Thanks for writing in.

Robert S Nicholson 2 years ago · 0 Likes

Re: "We'll begin with (and should probably end with) the unimpeachable Sir Isaac Newton's third law of motion: For every action there is an equal and opposite reaction. The quantity of energy in a bullet sent toward your game is the same as the energy sent back into the rifle — and your shoulder behind that rifle."

That is incorrect. Immediately after the shot is fired, the bullet and the gun don't have equal kinetic energies. What is true is that immediately after the shot, the total momentum of you and the gun is equal to the total momentum of the bullet and burnt powder. Newton's 3rd law is about forces, and it says that for every force, there is an equal and opposite force. If I push an object with my hand with a force of 5 pounds, that object is pushing back on my hand with a force of 5 pounds. If the Earth's gravity is pulling down on a rock with a force of 8 pounds, that rock is pulling up on the Earth with a force of 8 pounds. If I throw a rock, my hand exerts a force on that rock and that rock exerts an equal force on my hand. The net force on an object is equal to the rate of change of momentum. Momentum is mass x velocity or mv. Kinetic energy is (1/2) m v ^ 2. Google "conservation of momentum" and you will find many sites that explain it better than I can.

Be glad that this is the way it is. If the gun and bullet had equal kinetic energies immediately after the shot, the gun's recoil velocity would be about 18 times greater for the case of a 180 grain bullet and an 8 pound gun.

Mark 2 years ago · 0 Likes

You shoot the most rifle you can accurately shoot. You shoot 50 elk with a .243 and 50 with the .338. Accuracy being equal, You will lose more with the .243. The goal of the hunt is to anchor the quarry. I have found many elk dead the following spring hit with rounds that did not anchor them.
I have seen a 21 point atypical whitetail killed with a single .22lr round from a revolver. I have seen a bull elk get up after being solidly hit with a 240 gr pill and lost. I did not agree with either shot. Both animals deserved better. I have seen doves shot with a .410 which I did not agree with.
The goal should be to accurately shoot your weapon and to harvest game as cleanly as possible. I agree finding Thor's Hammer is more than a number.

rina 2 years ago · 0 Likes

very good points, ron. though I do think that, a shot with the same size and weight of bullet in the exact same spot on the same animal, that shot would likely be more effective with 3,000 foot pounds of energy than with 1,000, no?

Ron Spomer 2 years ago · 0 Likes

One would think so, but, based on what I've observed during more than 50 years of hunting, I doubt it. The projectile penetrates, tears and rips vital organs, arteries, etc. It takes a certain level of energy to do that ripping. Beyond that, what does the extra energy do? Pushes the expanded projectile more quickly and completely through the animal, perhaps? Much of it will be absorbed and dissipated by the elasticity of the body tissue. The point is, if the energy isn't applied to ripping, tearing, and smashing, it's superfluous. We know that a puny little 22 rimfire bullet applied to the brain/spine can incapacitate or outright kill an extremely large animal. Would a 30-06 bullet in the same place do it faster? The larger bullet in the heart/lungs/liver might kill fast because it touches/tears more vital tissue. Faster hemorrhaging. But energy? Naw.

Ric C 3 years ago · 0 Likes

Like real estate, location matters. I've killed deer, elk, buffalo, bear, antelope and small game with 290 gr. cast bullets at 2170 fps from my .358 Winchesters. Exit wound around 1 1/2", eat the hole. I never have had anything travel more than 30 yards after being shot in the right place. Some animals make no reaction at all when shot, even continue to feed, but sure as could be, they still fall after a few seconds.

Ben 3 years ago · 0 Likes

LOVE this article and just want to propose that besides (1) shot placement being the key; and (2) projectile construction also being a factor, with those two factors being equal energy STILL doesn't kill. The two statistical factors that kill, all else being equal, are sectional density and velocity. Energy (mass X velocity) doesn't factor into it because mass doesn't really matter. Once you get to a critical mass of bullet, which I posit is smaller than any we use, it's pure sectional density that causes penetration and it's pure velocity that causes more severe wound cavities, both temporary and permanent.

This can be seen by testing .30-30 Win against .243 Win at the same sectional densities and bullet constructions, in either actual deer or ballistics gel. They also have equal or similar energy (and recoil) but the .243 tears a more severe wound channel every single time. Even more drastically, hunt with a .25-06 and a .35 Rem at the same sectional densities. Same energy and recoil, but much more devastating wound channels with the .25-06.

Shot placement, bullet construction, sectional density, and velocity kill. In that order. Mass and energy don't really factor much into it.

Ron Spomer 3 years ago · 0 Likes

You're onto some important ingredients here, Ben, but missing a few points. One is that mass does matter because it contributes to tissue contact as well as penetration. Mass is a critical component of SD if you think about it as lead core vs. marshmallow core. In a .243" diameter bullet weighing 100 grains, SD is .243 whether the bullet is lead core or all copper. It would be the same if it were marshmallow core, but of course the specific gravity of marshmallow is so low that a bullet would have to be longer than your barrel to weigh 150-grains. And even then I doubt that soft core would hold up and penetrate as far as a lead or copper core. But this example is a ridiculous extreme. More reasonable is comparing a 100-grain lead cup-core .243 to an all copper 85-gr. Because the cup-core is likely to break up and lose momentum, the 85-gr. copper will likely penetrate better. Mass also matters because it is a major contributor to energy. Double projectile mass and you double energy. Double projectile velocity and you quadruple energy. And while energy per se doesn't kill, the action it imparts to the bullet does, i.e. ripping and tearing and sometimes smashing (vertebrae.) Tissue destruction (hemorrhaging and/or deconstruction of the function, i.e. heart muscle constriction/pumping) kills, and it is created by bullet mass and velocity aided by SD (to help the bullet reach the vitals.) And, as you note, without proper shot placement, mass, velocity (energy) and SD don't mean much. I've yet to see a gut shot deer die from all that massive, fully absorbed energy. Thanks for sharing your ideas, Ben!

Neil 3 years ago · 0 Likes

I think it's important to become very familiar with your bullet of choice and then match it to the velocity, distance and game. I often shoot a 10-14" Contender pistol. Most rifle big game bullets are not designed for such low velocities and most handgun bullets are not designed for such high velocity so I use a ballistics calculator and try to keep my distance within the velocity range needed for proper expansion. It's not always easy. Maybe I can hit big game at 200 yards but will my bullet expand properly? I have become very picky about which bullet I use.

Neil

Ron Spomer 3 years ago · 0 Likes

You are wise, Neil.

Ron Stewart 3 years ago · 0 Likes

I killed a Kentucky elk 6x6 which weighed something more than 850 pounds, generated 439 pounds of processed meat, with a 30-06 a few years ago. No problem what so ever. It was by no means the largest one killed in Kentucky that year. (They grow big in Kentucky.)

Ron Spomer 3 years ago · 0 Likes

That's a massive collection of venison of the highest quality, Ron. Congrats. I wouldn't doubt the 30-06 on anything.

High Master 3 years ago · 0 Likes

Excellent article!

Ron,
I'll be completely honest, as a accomplished highpower competitor and lifelong hunter I typically get so frustrated when I read most of the articles in various magazines or online. The majority of gun writers seem to be so far off base in their articles, especially related to match shooting. Anything to publish a story I guess. However, Credit to you! You have a new fan and follower. I've read several of your articles recently and you seem to be knowledgeable and accurate in your writings. Keep up the good work.

Ron Spomer 3 years ago · 0 Likes

Thanks High Master. I do not know that much about highpower competition, but I do try to report accurately what I've learned. Perhaps you could keep on eye on me and correct any mistakes and misconceptions? We don't want to foster inaccuracies. Thanks for the help!

High Master 3 years ago · 0 Likes

Sure. Glad to hear you're willing to learn and except when you may have misspoke. Many are not as humble so I typically just shake my head and move along. There are more enjoyable things to do rather then get into a battle with the author or a fanboy internet expert. Keep up the good work and I plan on targeting some of my reading time to your past articles.

Ron Spomer 3 years ago · 0 Likes

Excellent, High Master. We're all about providing information that is as accurate as possible. Knowledgeable, astute readers help.

John 3 years ago · 0 Likes

I think you could probably write a book or two on the variables involved when a bullet strikes an animal. Energy is just one part of the equation. I think energy is really only useful as a metric for comparing similar loads. When you start factoring in wildly different calibers or bullet construction, the measurement of energy isn't necessarily meaningless, but it's not really useful either. Which I believe is exactly the point you're making. Use the correct bullet at a range you're comfortable with and park it somewhere vital to life and the animal won't know the difference.

Ron Spomer 3 years ago · 0 Likes

John, you summed it up nicely!. Some folks have commented that a larger bullet carrying more energy will indeed do more damage than a smaller with less because -- well, hit a bull in the butt with a 223 Rem. and off he goes. Hit him in the butt with a 50 BMG and you'll likely find him lying there. But you and I and the rest of us hunters are talking about easily carried, reasonably recoiling hunting rifles up to about 416 Rem. Mag. Even elephant poacher John Taylor of the TKO formula reported that an elephant shot near the brain but not in it would recover whether hit with a 7x57mm or 500 Nitro Express. He could knock one out for several seconds to minutes with a big enough bullet carrying enough energy, but not terminate it without that brain hit, reinforcing what most experienced hunters say: placement first, then construction, lastly energy. Cheers John. Thanks for your contribution.

DOUGLAS HOWARD 3 years ago · 0 Likes

Professor Spomer scores another great lesson! Based on my experiences and your shared knowledge I sold my .375 H+H and .300 Win Mag. My 68 year right shoulder appreciates it and the .270 Win/140 gr or .25-06/100 gr are getting a lot more attention. Barnes and Nosler bullets, knowing where to park the shot and patience prevail. Past readings of Jack O'Connor, Bob Milek and Layne Simpson articles have made my hunting more knowledgeable, fun and less painful. I'll always remember your answer to me regarding your Ruger .270 and that "I just know where it shoots" is so important today. Thank you for the research and easily understood concepts. Is there a quiz at the end of class?
Doug Howard
Arizona

Ron Spomer 3 years ago · 0 Likes

There might be a pop quiz at any time. Remain alert.

Joseph Houseman 3 years ago · 0 Likes

I agree that numbers, energy, momentum, killing power, etc. are just numbers. You are mistaken however in your assertion that recoil energy of the firearm is equal to and the same as impact energy of the projectile. In fact, recoil MOMENTUM is always greater than projectile momentum but recoil ENERGY is a fraction of projectile energy. This is because the firearm is many times heavier then the projectile so its rearward velocity is a fraction of the projectile velocity and as you point out, energy increases with the square of velocity. A typical 30/06 load might produce a recoil energy between 15 and 20 foot pounds while the projectile energy pushes 3,000 ft.lb. This is exactly what makes firearms useable, the fact that recoil energy is not injurious.

Ron Spomer 3 years ago · 0 Likes

Thanks for this, Joseph. It seems when it comes to physics and terminology I'm always learning. Or correcting. Just now, with all the comments I'm getting from readers, I'm getting lost in definitions. But I believe I'm right in stating that for the action of the bullet moving forward (whether that's accurately described as energy or momentum or force) there is an equal reaction moving backward. The backward action is moderated or absorbed by the mass of the gun before being distributed via butt and comb to the shooter. I agree with your 20 f-p free recoil energy of the 30-06 load. But am I correct in interpreting that bullet energy is higher because the projectile is several hundred times lighter than the firearm? Yet, when that bullet strikes a 3,000 pound target, it does not move it. Put another way, 3,000 f-p of energy should be enough to lift 3,000 pounds a foot off the ground. It does not. I've seen bullets carrying 3,000 f-p fail to lift 30-pounds off a table.

Rick Hardy 3 years ago · 0 Likes

Speaking of bullets bouncing off an animal, I once met an elk hunter who claimed his 25-06 bounced off an elk he shot. He had the bullet with the rifling grooves and very little other marks which he said he picked up off the ground near the elk, which was killed by his next shot. Don't know what to think about that. Possibly the first bullet nicked a branch and hit sideways? Also possible he was pulling my leg.

Jimmy Carl 3 years ago · 0 Likes

You are correct in the fact energy doesn't kill on its own. Bullet weight and velocity doesn't, either. Bullet placement is the most important yet it's a variable, also. In my limited experience hunting whitetail deer one thing is apparent. Outside of placement, the most important thing in humanly taking your deer. It's knowing your and admitting your cartridges limitations. Where I hunt deer shots rarely exceed 200 yards. The average is around seventy. For those ranges my 7mm-08 or a 300 Savage is Ok, Further out at 3-400 yards a 270 or 30/06 would be my choice. Beyond that I wouldn't shoot. Magnums have no place in the field for me. The reason for these choices? At those ranges my shots impact at around 2400 and 2400 fps. Thehydrostatic shock waves and bullet penetration with adequate shot placement result in finding my deer without much tracking, if any.

JD Jones 3 years ago · 0 Likes

Well said. Energy is the most useless and misleading numbers in ballistics.

Ron Spomer 3 years ago · 0 Likes

Thanks for the support, JD! Of course, you're right.

Roxy Helfrick 3 years ago · 0 Likes

I agree with this to a point but I want to point out that this article talks about CNS or heart or brain shots where muzzle energy comes into play is when you dont have the perfect shot and need to bust through a shoulder to anchor the animal, the Eskimos have killed polar bears with a 22 LR but for the avg hunter I wouldn't recommend it

Ron Spomer 3 years ago · 0 Likes

Roxy, you are wise to not choose a 22 LR for polar bear hunting! But I think we can agree that even with your chosen larger, harder hitting bullet it's not the energy that kills, but the tissue destruction, which is my point. It just doesn't make sense to try to offset poor bullet placement or construction in hopes that more energy is going to make up for it. As I've observed many, many times, bullets with less energy kill just as quickly, sometimes more quickly, than those with more given similar placement. But of course you're right: you want enough energy to break the necessary bones and muscle to get inside to the vitals. Good expansion is also required, and that takes energy. I've bumped into some hunters so desperate for energy they were shooting rifles they couldn't handle, leading to more gut shots and failure all around. I have a guide friend who keeps a 243 Win in camp for those guys. After 3 or 4 pussy cat test shots, they're ready to hunt without flinching and the next buck or bull goes down with one shot.

‹ Dear Ron, would you suggest the 6.8 Western or 6.5 PRC?

Moose Dreams Can Come True ›