

This topic can be found at:
<https://forums accuratereloading.com/eve/forums/a/tpc/f/4711043/m/2861098911>

clintsfolly

04 February 2010, 20:40

Terminal Bullet Performance

Thanks Michael the 330hp are my goto boolit in the 450 so far 2 of our whitetails have meet them and lost. with this test what is the biggest critter you would hunt with this boolit?thanks again Clint

michael458

04 February 2010, 20:47

Another test I am now ready to report in full was with the 420 Cast performance and the 430 True Shot. I was astounded at the poor performance received from these, last week. So much so I needed to retest these. Now the deal is, years ago I tested this bullet in straight up wet news print and as I recall would give penetration to 25 inches or so at these same velocities! Now, I expected something more than what I got with these loads last week, in the new medium I have used since 2005.



45/70
Marlin Guide
430 True Shot Cast
1861 fps Muzzle
48 yd Impact 1726 fps
13 Inches Penetration
Retained Weight 410 grs



Now as stated, I could not believe this! Worst part is that I actually used this same bullet, same load out of a marlin in 2002 on a bovine! I was not pleased with performance however to be honest, but I did manage to get it on the ground for photos and then later it did eat rather well. There being the contradiction mentioned in the earlier post. Still, doing this today, I would not at all even consider this load or bullet for bovine! Not even a thought there of!!!!

Now, not being an expert on cast bullets, and not always thinking of everything, Mr. Whitworth mentioned the other day for me to slow this bullet down a bit to the 1200 fps level, and penetration and performance would be better. Yesterday, I did just that, and at least 50% of the time, that is correct if it stabilizes? And as you can plainly see there is much less bullet upset at the lower velocity.

45/70
Browning 1885
420 Cast Performance
#1 1223 Muzzle 1145 48 Yd Impact
#2 No Velocity Measured
#1 16 inches Straight Penetration
#2 Lost Stability 11" penetration
found Sideways in Medium



Michael

<http://www.b-mriflesandcartridges.com/default.html>

The New Word is "Non-Conventional", add "Conventional" to the Endangered Species List!
Live Outside The Box of "Conventional Wisdom"

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michael458

04 February 2010, 21:26

Hey Andrew! Welcome, and glad to have you out of the lurking mode and contributing!

First, it's damn hard to assume anything at all when it comes to shooting, and especially terminal penetration, about the time you assume something, the bullet will make an idiot out of you! Happens to me all the time!

#2--when comparing the same bullet construction, lets example a Swift A Expanding--further let's say 458 caliber 450 Swift--458 caliber 500 Swift. Same gun, same medium, same velocity same everything, then yes, the 500 with the higher SD will penetrate further. Same goes for the same design, nose profile solid--450 Barnes Banded .458 and 500 Barnes Banded .458. Change construction or type bullet in expanding, change nose profile on solid, SD goes out the window. Everything the same, SD wins.

#3--I don't know, they won't allow me to have tools in which I can destroy things, so no drills and don't know how to work one proper anyway. Probably do more damage than any good coming of it. I will let someone else answer that one.

#4--It is my opinion that Nose Profile is everything and trumps everything. This is not an opinion shared by many so..... Now if you have two solids exactly the same, then SD wins again. But to me it is rather easy to prove nose profile as I have many much lighter bullets of same caliber that routinely and consistently out penetrate any RN design solid. For instance, a 330 Barnes Banded 458 Solid will routinely and consistently out penetrate any 500 gr 458 RN solid. SD? Where does SD come in exactly here? It is exactly the same with my .500s and exactly the same with my 416s. Maybe other folks rifles do not shoot the same as mine?

#5--bullet construction very important, especially penetrating T'Rex skulls and to some degree elephant skulls and bones!

Also, it appears that your own testing as described is very very close to what I have been doing here, even with a different medium. My medium is not wet print alone. Of course all depending on the bullet for comparison.

Not late, and welcome again, glad to have you!

Michael

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michael458

04 February 2010, 21:29

quote:

Originally posted by clintsfolly:
Thanks Michael the 330hp are my goto boolit in the 450 so far 2 of our whitetails have meet them and lost. with this test what is the biggest critter you would hunt with this boolit?thanks again Clint

Clint

My opinion is you have a perfect use for your bullet as described. Running at high velocity for a cast it's hitting the deer pretty hard I would bet, I would guess that it is knocking the crap out of deer. I think I would slow that bullet down a bit and see what happens, you might be able to get good enough penetration to go up to 250-300 lb critters I would think. I have already thought to slow it up a bit and see what happens. Will report it for you probably next week at lower velocity! Hows that?

Michael

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capoward

04 February 2010, 21:35

quote:

Originally posted by Whitworth:

quote:

Originally posted by someoldguy:

quote:

I miss it too Glenn, lost the last of the grandparents in June 1991 and definately don't hear it here in California.

I could only imagine that in California they think you're a hick if you say "y'all." 🤔
My playful suggestion about "y'all" came up in Hawaii, of all places. I explained to a lady why "y'all" should be used by everybody. When I'd finished, she playfully agreed.

Unfortunately, that was all she would agree to, though. 😞

Glenn, that depends where you are in California. In some parts of the Central Valley (the biggest agricultural area of the US of A) you would swear you aren't really in California.

Yep... add in Imperial Valley to the mix and you have Arkie's, Okie's, Texacan' (plus a few other Southern states) meet Mexico! The world of the working down to earth folks...totally different worlds from the "elitist" islands of knowledge and good living!

Jim 🤖

"Life's hard; it's harder if you're stupid"
John Wayne

michael458

04 February 2010, 21:38

Real quick, have to get some 416 B&M loaded and to the range with 3 of them. Guys, sometimes I need a bump or a reminder about things. Capo pointed out the twist issue, Whitworth pointed out the velocity issue with the cast bullets, great suggestions, I don't always catch. Between real work, shooting, testing loading, reporting, phone and in general this place is a madhouse nearly every day, I don't always think of everything, and don't always remember everything, please feel free to do so! As we can all learn from this and don't want to rely upon me 100% of the time to remember everything, sometimes I have old timers, and things slip! So thanks to Capo and Whitworth for the most recent, and thanks to all to help me keep up!

Next week, still working with 45/70 some, have a couple more bullets to renew the tests, also will retest for Clint at lower velocity, and I want to hit a few times with Sharps to get a better feel and since I have loaded ready to go there, it should not be an issue. I have

chewed up another two boxes full completely, so new boxes will be made, might even do some T'Rex work before doing that next week too! So for this week that's all I will have for now.

I am getting a bit concerned about my Federal 215 primers, down to 4000 at the moment. I have not found any yet anywhere? When I start getting ugly low, I might ask if anyone wants to trade some large handgun, small handgun, small rifle, or even 210 large rifle for some 215s????? Might even trade a few more for less for 215s?

Also supplies of test medium is starting to see bottom. I still have a few boxes left to build, but it won't be long before another stock up on that!

Now, off to the range another for another day!

Michael

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Whitworth **04 February 2010, 22:38**

Michael, you were obviously degrading the bullet nose with speeds of 1,800 plus fps. That lead bullet just cannot maintain its nose profile at those velocities. If 1,200 fps didn't stabilize them, I would run 'em a little faster but not exceed 1,400 or so fps -- again, to maintain the integrity of the nose.....

"Ignorance you can correct, you can't fix stupid." JWP

If stupidity hurt, a lot of people would be walking around screaming.

Semper Fidelis

"Building Carpal Tunnel one round at a time"

boom stick **04 February 2010, 23:09**

Seems what was needed was a 1 in 10 twist in those cast booolits 🇺🇸 🍻

[577 BME 3"500 KILL ALL 358 GREMLIN 404-375](#)

we band of 45-70ers (Founder)
Single Shot Shooters Society S.S.S.S. (Founder)

capoward **05 February 2010, 00:04**

quote:

Originally posted by boom stick:

Seems what was needed was a 1 in 10 twist in those cast booolits 🇺🇸 🍻

🇺🇸 Michael doesn't have 1 in 10" twist in his rifles; that's to fast for Winchesters! 🍻

Might spin those booolits to quick! 🇺🇸

Jim 🍻
"Life's hard; it's harder if you're stupid"
John Wayne

someoldguy **05 February 2010, 00:28**

quote:

Glenn, that depends where you are in California. In some parts of the Central Valley (the biggest agricultural area of the US of A) you would swear you aren't really in California.

thumb Yep... add in Imperial Valley to the mix and you have Arkie's, Okie's, Texacan' (plus a few other Southern states) meet Mexico! The world of the working down to earth folks...totally different worlds from the "elitist" islands of knowledge and good living!

I guess it's part of being human to have stereotyped images about places you know nothing about. Thanks for setting me straight about California, guys. 😊

quote:

First, it's damn hard to assume anything at all when it comes to shooting, and especially terminal penetration, about the time you assume something, the bullet will make an idiot out of you! Happens to me all the time!

Happens to me especially, Michael. 🤔

I know weird things do happen while shooting.

I was shooting my old Colt Army Special in .41 Long Colt. I had probably among the last box of factory ammo that Winchester turned out for this caliber. I was shooting into a big rotten stump against a bank so that I could recover one of the bullets to see how the hollow base of the .41 LC worked.

Curiously, I found one close to the surface of the stump where I had been shooting. Closer inspection showed why. I had hit one of the bullets imbedded in the stump and knocked it back towards the surface! It had the scar where the other bullet had grazed it along the side.

Glenn

michael458

05 February 2010, 00:33

Don't "y'all" worry, RIP is coming with his 1:10 twist 458 B&M and will be showing us a new trick in the not too distant future!

While we are on twist, Boomy, you might have a point! I will make a note and try some of these 420 Cast Performance in the 458 B&M and it's 1:14 twist. Those were tested in 45/70 in the 1885.

I freely admit twist rates have not been at the top of my list of concerns in the past, I am learning much here myself. It's always been sorta one of those things that I included as "Don't tell me about the labor pains, show me the baby" things! Now I know there has to be a great reason for this, but why have a 1:18 or 1:20 twist rate, say in 45/70? Heavy Slow bullets? Traditional for cartridge? Lead, to keep them from slipping as they go down the bore? I am sure Sharps can answer that for me! And probably most of the rest of you too!

Whitworth

Without doubt you are 100% correct, as we see. I want to try them next week in the 458 B&M at 1200 fps or so see what happens.

Again, thanks for bring that to light for me!

Capo

Keep it up, damn trouble maker! 😂 LOL

Wow, got a couple of things the last day or so. Simply must spread the joy!

First, the NonCons are all 1 hole deals if I do my part on everything, from the 416s-458s-and 50s! At 50 of course. Hell can't see a 100 anyway, and it's too cold for me to be out! And who needs to shoot past 50 yds anyway, that's even too far! Accuracy is better than I can shoot with all of them! I tell you this, regardless of brass or copper, these are the finest most accurate bullets I have ever used in any of my big bore rifles! These CNC machined bullets are in fact "MAGIC"!

Number two, I know this don't exit everyone, but I ended up with 16 lbs of H-322 for the 500 MDM recently. Looking through old load data and 50 B&M I saw where I had done some work with H322, but left it behind. So I decided to revisit that issue since I had 16 lbs, oh and another 4 1 lb containers I forgot about, 20 lbs of H322. Loaded up some of the 510 SSK Solids and some 470 HPs--510 Solid 2136 fps right out the muzzle! 2201 for the 470 HP. First go, pressures normal. Now that's in the 18 inch gun too. 2105 has been the limit with IMR 4198, which has been tops for the cartridge so far! Pleased I am, and 20 lbs to work with!

Michael

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boom stick

05 February 2010, 00:35

quote:

Originally posted by capoward:

quote:

Originally posted by boom stick:

Seems what was needed was a 1 in 10 twist in those cast booolits 🤔🔫

🤔 Michael doesn't have 1 in 10" twist in his rifles; that's to fast for Winchesters! 🔫

Might spin those booolits to quick! 🤔

Gunna have to rebarrel those marlins and Winchesters to make those heavy bullets spin stable in media all the way to the end.

Maybe settle on a one in twelve so rifling engagement with softer lead wont be so bad.

Might keep those Barnes Busters stay straight all the way to the end too.

[577 BME 3"500 KILL ALL 358 GREMLIN 404-375](#)

we band of 45-70ers (Founder)

Single Shot Shooters Society S.S.S.S. (Founder)

michael458

05 February 2010, 00:51

I can tell you this, I am beginning to think if a fellow really and truly got serious about shooting 45/70 to consider a rebarrel with 1:12! Now I am sure someone has more knowledge than I about this, but I would lean that way.

All the 50 B&M AKs are 1:12, all the .500s are 1:12. Speaking of which I am going to do some 50 B&M AK work in the near future, can't wait to show you those big Hornadys at 2000 fps at the muzzle!

I got a good one for you about Terminal Penetration and a 115 gr FMJ 9mm. This goes with odd things in shooting! Way back when I used to do a lot of handgun shooting. So one summer day out shooting some steel in the back yard. A little close I suppose at 5 yards. And we all know there is no telling where a round nose might veer off to! Well one of those caught a small dimple in the steel and came back directly at me, went through my t-shirt and dug it's way 1/2 inch into my belly fat right below my navel! Damn, it was burning, so I plucked it out quickly, burned my finger so I dropped it, never recovered or found it, run in the house like a scalded dog to get bandaged up! Moral

of the story? Don't shoot FMJs in shot up steel, and always have enough belly fat to stop a round nose bullet! 🤔

Michael

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boom stick

05 February 2010, 01:06

Seems Michael has found religion



quote:

I can tell you this, I am beginning to think if a fellow really and truly got serious about shooting 45/70 to consider a rebarrel with 1:12!

I think this is correct if you want to shoot 458 bullets heavier than 400 grains at lower 45-70 velocities.

[577 BME 3"500 KILL ALL 358 GREMLIN 404-375](#)

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Single Shot Shooters Society S.S.S.S. (Founder)

boom stick

05 February 2010, 01:09

So your mafia name is "Two Belly Button Michael"?

quote:

A little close I suppose at 5 yards. And we all know there is no telling where a round nose might veer off to! Well one of those caught a small dimple in the steel and came back directly at me, went through my t-shirt and dug it's way 1/2 inch into my belly fat right below my navel!

[577 BME 3"500 KILL ALL 358 GREMLIN 404-375](#)

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Single Shot Shooters Society S.S.S.S. (Founder)

capoward

05 February 2010, 01:40

quote:

Originally posted by michael458:
Capo
Keep it up, damn trouble maker! 😄 LOL



quote:

Originally posted by michael458:
Don't "y'all" worry, RIP is coming with his 1:10 twist 458 B&M and will be showing us a new trick in the not too distant future!
Michael

Bet it'll outdo the 1:14 twist for straight-line penetration!



Jim

"Life's hard; it's harder if you're stupid"
John Wayne

sharpsguy

05 February 2010, 02:15

michael458--I want to thank you for testing these loads for me. I think you have provided the answer for a couple of remaining questions I had.

I have used all of these bullets you tested on American bison, and all of them have given reliable straight line pass through 100% of the time. I have used the 520 RN and the 511PP on kudu, black and blue wildebeast, zebra and gemsbok as well as some of the smaller antelope in Africa. I shot completely lengthwise on the black wildebeast from ham out his chest for a measured 70 inches of penetration from 150 yards with the 520RN. So I know these loads penetrate flesh. They also drive through shoulder blades, skulls and ribs quite easily and punch nice, neat round holes in green living bone on the way through. I have never recovered any of these bullets from an animal.

Having said that, and having seen the result of your tests and correlating it with what I have seen in the past, leads me to make a couple of educated semi-conclusions.

With ANY bullet, preserving the integrity of the nose shape is critical to penetration. This is dramatically apparent in these tests of lead bullets. It is ALSO THE REASON for the big difference in first and second shot penetration we see in these tests. You will note that the first shot is 25 to 40 fps faster than the second. This is due to the first shot coming from a clean barrel, and the second shot coming from a fouled barrel. The slower bullet penetrated better BECAUSE THE BULLET KEPT ITS NOSE SHAPE INTACT.

These bullets were soft, cast 30-1 lead to tin, and I loaded them to the maximum velocity I THOUGHT would enable the nose to stay intact. It seems I misjudged this just a bit. I think FOR THIS ALLOY the velocity should be about 40 fps LESS to achieve maximum penetration. Of course, I have the very easy option of simply casting the bullets harder and staying at this velocity.

Actually, I feel that if we test the remaining bullets at 50 yards we will see some amelioration of the nose deformation on the first shot as the impact velocity will be about 20 fps or so less. That in and of itself would be a good test.

Most of my shots on game have been in the 100 to 500 yard range where the impact velocities have been in the 1000 to 1150 fps range. I wanted to see what would happen to the bullet on something up close, hence my request for the 22 yard test.

The reason you see the 1-20 and 1-18 twist on the Sharps and the BPCR rifles is that at the velocities where these rifles work, and at distances from 400 to 1000 yards it requires a bullet in the 500 to 540 grain weight range to deal with the wind and not give excessive bullet drift. The 1-20 twist was found to address this quite nicely, AND stabilize a 400 grain 45 caliber bullet at the same time. The 400 grain bullet works across 300 yards or so, and keeps recoil down--a consideration when loaded in a light military carbine or a lever gun. The short light bullet is also needed to keep COAL so that the ammo will cycle through a lever gun.

When the guys started to get serious about shooting at 1000 and 1200 yards, stability of the bullets became an issue with the 500 grain plus bullets past the 800 yard line. Enter the 1-18 twist. It was originally employed as a long range target twist, and carried over to the 45-110 for use on the American bison in the Sharps.

The reason the original guns did not use faster twists in the 1-10 range was fouling. A fast twist accumulates fouling faster than a slow one, and 1-18 is the fastest twist that will accommodate a reasonable string of shots with good accuracy without wiping. I have noted that my 1-18 twist guns do not shoot the lighter bullets nearly as well as the slower 1-20 twist guns do.

Bear in mind that we are talking about a whole range of issues here as far as using the fast twist barrels. They obviously work with higher velocities and smokeless, but would present a whole range of problems with black powder. Hope this helps.

Thanks again.

someoldguy

05 February 2010, 02:27

quote:

Bet it'll outdo the 1:14 twist for straight-line penetration!

That would be my bet too, but I know how this terminal ballistics stuff has a way of making a fool out of me and my expectations. 🤖

Still, it's a lot of fun. 😊

Glenn

someoldguy

05 February 2010, 02:49

quote:

Well one of those caught a small dimple in the steel and came back directly at me, went through my t-shirt and dug it's way 1/2 inch into my belly fat right below my navel! Damn, it was burning, so I plucked it out quickly, burned my finger so I dropped it, never recovered or found it, run in the house like a scalded dog to get bandaged up! Moral of the story? Don't shoot FMJs in shot up steel, and always have enough belly fat to stop a round nose bullet!

I know ricochets are some scary stuff! 😬

Any experiences with ricochets with big bore bullets?

Glenn

capoward

05 February 2010, 03:06

quote:

Originally posted by someoldguy:

quote:

Well one of those caught a small dimple in the steel and came back directly at me, went through my t-shirt and dug it's way 1/2 inch into my belly fat right below my navel! Damn, it was burning, so I plucked it out quickly, burned my finger so I dropped it, never recovered or found it, run in the house like a scalded dog to get bandaged up! Moral of the story? Don't shoot FMJs in shot up steel, and always have enough belly fat to stop a round nose bullet!

I know ricochets are some scary stuff! 😬

Any experiences with ricochets with big bore bullets?

Not me but do you mean like this?

<http://www.youtube.com/watch?v=mn0MFqP1js0>



Jim 🤪

"Life's hard; it's harder if you're stupid"

John Wayne

someoldguy

05 February 2010, 03:17

quote:

Not me but do you mean like this?
Eeker

Yup! Now that certainly is a big bore ricochet if there ever was one!



So I guess the main moral of the story is: Don't shoot at steel!



Glenn

michael458

05 February 2010, 04:31

Sharps

I don't have time tonight for a proper reply. But on all accounts you are correct. I will test again next week with the remaining rounds, same rifle, everything, just at 50 yards instead of 22. I would guess we will see at least 100-125 fps less impact and business should pick up. Very excellent suggestion, I will sort that out. The twist info makes perfect sense too. Myself and probably a good portion of the rest here not having much experience with the black stuff!

By the way, the rounds shoot so well there will be zero issues in the 1885 at 50 yds, they happen to be dead spot on at 22. 50 will not be a problem, we will be able to get proper data and compare the two. Good thing you sent 5 each!

As we spoke, these correlate much different from test medium to animal tissue. Not solid, and not expanding either really. Something we have no experience with trying to correlate.

Catch up with this a little more tomorrow in the morning.

Have wife birthday party, gotta go now.

M

<http://www.b-mriflesandcartridges.com/default.html>

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jeffosso

05 February 2010, 05:00

MM - thanks for these tests.. you are adding to the shooting sports

****IF**** i buy you a box of garrett hammerheads, would you test them?

#dumptrump

opinions vary band of bubbas and STC hunting Club

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[What is an AR round?](#) Case Drawings [416-458-470AR](#) and [500AR](#).
[476AR](#),
<http://www.weaponsmith.com>

boom stick

05 February 2010, 05:19

Don't do it Jeffe/Michael!!!
There wont be any way to stop the bullets!!!



quote:

Originally posted by jeffosso:
MM - thanks for these tests.. you are adding to the shooting sports
****IF**** i buy you a box of garrett hammerheads, would you test them?

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we band of 45-70ers (Founder)
Single Shot Shooters Society S.S.S.S. (Founder)

jeffosso

05 February 2010, 05:28

quote:

Originally posted by ALF:

these posts are HYSTERICAL .. alf FREQUENTLY goes back and revises history ..

IN this thread, he's removed everyting where he's disagreed with MM and been PROVEN wrong ..

i just LOVE it .. the guy makes it where he's never wrong...

ALWAYS quote alf and shootaway .. they "Revise" everything

#dumptrump

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[476AR](#),
<http://www.weaponsmith.com>

michael458

05 February 2010, 06:51

OK back for a minute.

Jeffe!

Thanks buddy, that means a lot.

Hammerheads, hell yes, full speed ahead, no stopping us now! Sure, I assume 45/70.

Boomy, I bet damn good money I can stop them!

Catch you guys in the morning!

Michael

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ALF 05 February 2010, 07:30

jeffeosso 05 February 2010, 07:56

Alf
really? I have all the "proof" i need that you are a revisionist

quote:

Originally posted by ALF:

which was my point ..

as for your ridiculous "conditions" v..prove these to be consistant from animal to animal, shot to shot, live, dead, wounded, then we'll talk ..

sorry to stink up your great thread, MM

#dumptrump

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[476AR](#),
<http://www.weaponsmith.com>


ALF 05 February 2010, 08:01

jeffeosso 05 February 2010, 08:28

quote:

Originally posted by ALF:

Jeffe

Exactly what I expected 

when one sets out to prove what one knows, things are generally uneventful.

when men try new things, they are improved

thanks for improving things, MM

#dumptrump

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[476AR](#),
<http://www.weaponsmith.com>

Gerard

05 February 2010, 09:58

Alf

quote:

Ok I will put out a challenge to you and anyone who wishes to participate.

Here it is:

1. Produce credible evidence or any credible reference to or any reference to a scientific journal /paper/ textbook/ mathematical penetration model, that rotational velocity / angular momentum / angular velocity has any effect on penetration depth of a projectile

This is not what we are saying. You are right. Rotational velocity cannot work in this context. Agreed. Yes. No argument on this. Yes. Yes. Yes.

quote:

other than the fact that it sets up angle of attack (yaw) at impact.

That is the crux of the matter. This is what we are saying. This is the important fact. This is what matters. More twist = less yaw closer to the muzzle. It sets up the bullet for better straight line penetration and that increases penetration depth.

quote:

Thereby, by implication, a faster twist rate barrels give deeper penetration than slower twist rate barrel? Please produce this and I will admit I was wrong!

You have seen this in many examples quoted on this thread and others and I have observed this for the last 18 years in the shooting of several thousand head of African game. The reason is (I think you may have mentioned this yourself):

quote:

the fact that it sets up angle of attack (yaw) at impact.

ALF

05 February 2010, 10:54

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Gerard

05 February 2010, 12:28

Alf,

quote:

If I take two of your bullets and I shoot them at identical speeds one from a fast twist barrel and the other from a slow twist barrel, both impact the target at say 100 m both impact at the same angle of attack.....

How can they have the same angle of attack? You said 3 and a half hours ago that twist determines rotational velocity. You said that rotational velocity determines the angle of attack. Therefore twist determines the angle of attack. Therefore differing twist rates for the same bullet results in differing angle of attack.

quote:

please show me or explain how the angular velocity difference between the fast and slow bullet effects penetration depth.

This is not what we are saying. You are right. Rotational velocity cannot work in this context. Agreed. Yes. No argument on this. Yes. Yes. Yes.

quote:

There is not a single mathematical derivation whether you use a newtonian mechanics model, a hydromechanics based model or even a thermodynamics based model where Angular velocity, angular momentum, rotational velocity or rotational energy is accounted for in the penetration process.

This is not what we are saying. You are right. Rotational velocity cannot work in this context. Agreed. Yes. No argument on this. Yes. Yes. Yes.

quote:

Secondly more twist means greater static stability but by defintion less tractability and that means an increase yaw at impact..... exactly the reason why long distance shooters choose just the right twist rate to give the lowest possible SF values that will give unity over distance. If the twist is to tight the bullet will have a large yaw angle which will negatively impact on drag.

Which is precisely why we recommend high SF values for close range and lower SF values for longer distances.

[Example of FN recommendation.](#)

[Example of HV recommendation.](#)

[Example of SP recommendation.](#)

quote:

So do you agree with the results of these tests? As I recall you're FN bullets don't do so well here, in fact they seem to be the worst of all of these FN bullets tested

Where do you see that? You should spell it out for me with examples, I just read the numbers and facts: X inches deep / turned / did not turn.

RIP

05 February 2010, 13:09

Alf,
You are a liar if you say any tests presented here show GSC bullets are the worst.
What a psychologist you are!

Where are the studies that prove twist has no effect on game animal penetration by solids or softs?

Do not present the theoretical.
Where is the real evidence that meets your statistical standards?

What? It hasn't been done?
What Michael has been doing here may be accumulating into the best evidence so far?

Look at the high speed films of expanding bullets passing through ordnance gelatin.
The bullet is spinning.
The petals are folding back and being twisted to the same turn as the rifling from which they came.
The gelatin is cavitating behind the leading surface of the bullet.
The density around that bullet is immediately much less than 1000 times that of air.

Besides aid in transition from air to target, obviously there is something more to twist inside the target.

Interacting with you here is like doing a rectal exam on an 88 year-old woman with melanotic stools.
She says to me: "I don't like this."
I say to her: "Do you think I am enjoying myself?"

416Tanzan

05 February 2010, 13:23

For Alf, maybe Gerard,

I think that what we are seeing in Michael's tests is some kind of stability relationship with 'supercavitation'. As supercavitation approaches the bullet's physical dimensions the slower twist bullet loses stability (allows yaw) and starts to swerve. I don't know what is going on in the medium, say at 20-30", to cause the swerving, but Michael's tests, assuming comparable media density et al., are showing a twist factor that will need to be explained.

And in the meantime, anyone shooting a FN solid at a buffalo will be advised to use a higher stability factor rather than a lower one, especially until the phenomenon is better understood.

My 416 350 gr. has a 'stability factor' from JBMballistics of 2.5 and seems to penetrate well in tests. Ironically, my light 338 [could be backup in some situations!] 250grFN solid has a stability factor of 2.9"! I would be happy to try either on a buffalo lengthwise as a second shot, though I belong to the 'controlled-expansion/guaranteed-penetration' school for a first bullet on buffalo. For the 416 that means something like Gerard's 330 HV or Barnes 350 TSX, though for 338 we are seeing the need for a little extra weight and the Barnes 225 TTSX would be minimum, and 250 TSX/MRX preferable, if shooting a buffalo.

O COMO SE DICE EN EL CENTRO DEL CALIFORNIA
QUE PIENSAS?
ya `ani, ma tiftikir?
unawaza gani?
(and other local dialects for ally'all)

+ + + + +

"A well-rounded hunting battery might include:
500 AccRel Nyati, 416 Rigby or 416 Ruger, 375Ruger or 338WM, 308 or 270, 243, 223" --
Conserving creation, hunting the harvest.

416Tanzan

05 February 2010, 13:45

PS: stability factor of 225 TTSX in 1x10" twist of 338 is 1.98, while the S.F. of the 250 TSX is 2.16. Both are sufficient and only get more stable as soon as the mushroom/flower develops. The 350 TSX in 16.5" twist of 416 Rigby is also 2.1.

I might recommend a 14" twist as better for the 416 Rigby with the new generation of mono-metal bullets. But 16.5" was traditional and comes on some factory offerings like CZ550. And it works.

+ + + + +

"A well-rounded hunting battery might include:
500 AccRel Nyati, 416 Rigby or 416 Ruger, 375Ruger or 338WM, 308 or 270, 243, 223" --
Conserving creation, hunting the harvest.

Warrior

05 February 2010, 14:00

"I have observed this for the last 18 years in the shooting of several thousand head of African game." ... Gerard.

Gerard,

Put some thoughts on this very fascinating subject that we grapple with ... and with specific reference to your experience or rather your interpretation of your observations:

1. Were these animals shot with the same loads and bullets, but with differing twist rate barrels?
2. Which cartridge was used and the differential twist rate or were multiple rigs involved?
3. Have you logged the results in an easy to use matrix form or do they only exist in mental form?
4. Then, how did you account for shot to shot variation in the animal when judging the depth of penetration?
5. After number 4, you should obviously have a revised position due to the empirical correction factor that you brought to bear, not so?
6. To make this more interesting, did you use SF values in your assessment rather than just pure bullet spin by virtue of twist rate?
7. This leads us then to the statement that you made before, and I quote it here for ease of reference:

"With FN bullets we recommend a stability factor in EXCESS of 2.5 for reliable linear penetration. The 300gr FN has a stability factor of 2.39 to 2.44 from 2000fps to 3000fps. Again not ideal."

Needless to say, this is a very fine observation on your part, and the fact that a critical datum point has been established for "reliable linear penetration" is a contribution that needs to be further explored but wait, this position is only for the 375 H&H; not for the 9,3 x 62 mm, as it apparently differs by caliber, because you now specify a minimum SF value of 2.0 !!! We should obviously bear in mind that an increase in diameter from .366" to .375" plays havoc and so a uniform answer to this whole question is not possible, and it is all due to that difference sitting in the 3rd decimal, eh? Oh, I forgot, these bullets are shot at different velocities and the stagnation pressure encountered in the animal also differ. And if this is so, then any given cartridge will also react differently at say 50 yards as opposed to say at 300 yds, as impact velocities will differ, and so the drag in the animal or the stagnation pressure will differ by the square of the velocity. But as the SF value of a bullet goes up over distance, of which we do not know instinctively the precise extent, it becomes even more interesting that one can pitch a SF value of 2.5 and not 2.44 for example. All observed by the naked eye of course. This whole thing is now becoming nebulous, not so?

Now the question is to make any sense of your research project, and it has to be research if such an endeavour is repeated en masse, what is the conclusion or outcome? In other words, we have to pin it down some how so it does not look too woolly would you say that for every 5% increase in the twist rate there is an increase of X% in penetration, or would you prefer to rather express it in terms of the more precise SF value equation for a specific bullet that was used, rather than crudely for the spin of a variety of bullets that are all the same (SF values will differ for different type of bullets)? If this cannot be done, then the perception is shall we say ... rather woolly.

Warrior

416Tanzan

05 February 2010, 14:05

PPS on 416 stability factor from JBM:

- a 14" twist with 350TSX gives 2.93 SF
- a 14" twist with 350 BS gives 3.6 SF
- a 16.5" twist with 350TSX gives 2.108 SF
- a 16.5" twist with 350 BS gives 2.59 SF

all good in the hood.

anything over 2 in expanding is great and anything over 2.5 in solids is great.

These 'wooly' sf margins can be treated as

'rules of thumb' for the time being to give a safety margin to hunters. And since it is relative and imprecise at this stage, someone using a 2.4 SF flatnose solid shouldn't feel too perturbed, even though advised to go 'shorter' on bullet length or faster on twist (which is more difficult to adjust!).

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"A well-rounded hunting battery might include:

500 AccRel Nyati, 416 Rigby or 416 Ruger, 375Ruger or 338WM, 308 or 270, 243, 223" --
Conserving creation, hunting the harvest.

416Tanzan

05 February 2010, 14:49

The 416 Rigby runs into a potential problem with 400 grain mono-metals, compare the 350 grains with 400 grains, following.

quote:

PPS on 416 stability factor from JBM:
a 14" twist with 350TSX gives 2.93 SF
a 14" twist with 350 BS gives 3.6 SF
a 16.5" twist with 350TSX gives 2.108 SF
a 16.5" twist with 350 BS gives 2.59 SF

- a 14" twist with 400TSX gives 2.39 SF
- a 14" twist with 400 BS gives 3.02 SF
- a 16.5" twist with 400TSX gives 1.72 SF
- a 16.5" twist with 400 BS gives 2.18 SF

Since my 416 has a 16.5" twist, I limit my bullets to 350grains in mono-metals. If I felt I really needed 400grains, I would go to lead cores and shorter bullets. This is where the twist differentiates choices. The 14" twist would nicely stabilize the 400 grain Barnes for all hunting purposes, but the 16.5" twist lowers one into a grey/red area that can be avoided by choosing a 350 FN solid that will penetrate more than needed on any buffalo.

By the way, even those red stability factors are great for anything less than 'dangerous thick-skinned game', but then again, what is the point of a 400 grain bullet for less than 'dangerous thick-skinned game'. Bringing me back to the 350 grain mono-metals in 416 for a 16.5"

twist.

+ + + + + + + +

"A well-rounded hunting battery might include:
500 AccRel Nyati, 416 Rigby or 416 Ruger, 375Ruger or 338WM, 308 or 270, 243, 223" --
Conserving creation, hunting the harvest.

Gerard **05 February 2010, 15:27**

Warrior/Truvelloshooter/Chris,

quote:

Jut some thoughts on this very fascinating subject.....

This subject has boggled/flabbergasted your two brain cells for the past decade. Give it up.

quote:

your experience or rather your interpretation of your observations.....

You find it staggering that someone could have so much more practical experience than what you have. Grow up, get out more and do some actual hunting/shooting. Just a hundred or so animals a year. Arrange to observe the hunting/shooting of a hundred or so by others as well. After five years, come back and talk to me, if you have learned something.

quote:

This leads us then to the statement that you made before, and I quote it here for ease of reference:

"With FN bullets we recommend a stability factor in EXCESS of 2.5 for reliable linear penetration. The 300gr FN has a stability factor of 2.39 to 2.44 from 2000fps to 3000fps. Again not ideal."
Needless to say, this is very fine observation on your part, and the fact that a critical datum point has been established for "reliable linear penetration" is a contribution that needs to be further explored

We have been exploring it here at AR for more than five years and all of that has gone over your head. You have asked this question with monotonous regularity several times every year and every answer and discussion has gone unnoticed by you. You must have gone to a very weird school. They taught you to write but not read. How strange.

quote:

This whole thing is now becoming nebulous, not so?

Only in your triple hornswoggle conditioned head. The rest of us have a pretty good grip on what is going on here. However, you said it and I can scarcely imagine a better description of your reasoning/understanding of the subject. Well done - you got something right!