



Accademia Ambiente
Foreste e Fauna del Trentino



Hunting efficiency with non-toxic ammunition

Ettore Zanon

NON-TOXIC BULLETS

Doubts vs. **Acceptance**
in the hunting community

Do lead-free bullets
work well enough?



TRADITIONAL LEAD PROJECTILE

① LEAD CORE

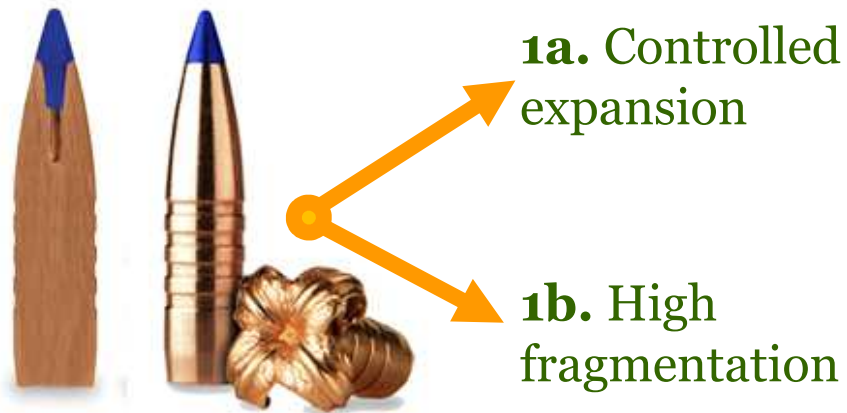
② copper (tombac) jacket



rws-munition.de

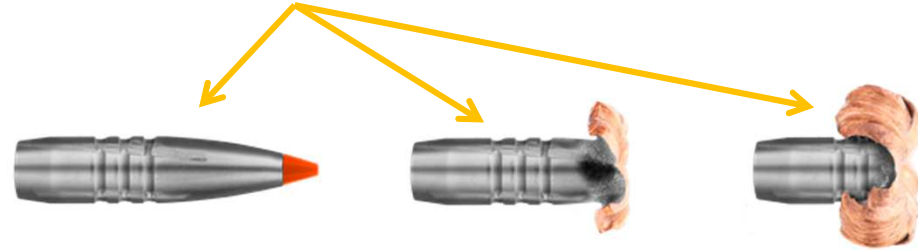
NON-TOXIC (lead-free) BULLETS

1. MONOLITHIC BULLETS



www.barnesbullets.com

Just copper (brass)



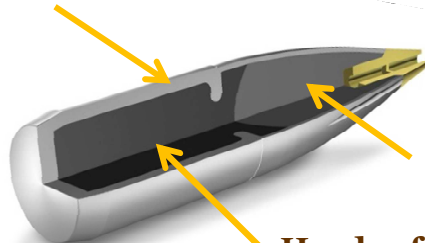
rws-munition.de



llutzmoeller.net

2. COMPOSITE LEAD-FREE

Nickel-plated jacket



Food-safe tin core

Harder food-safe tin core



rws-munition.de

THE MARKET SAYS... “COPPER!”



HUNTING AND GAME MANAGEMENT REVEALING EXPERIENCE

©Carlo Kinsky dal Borgo



Carlo Kinský dal Borgo (Professional Hunter)

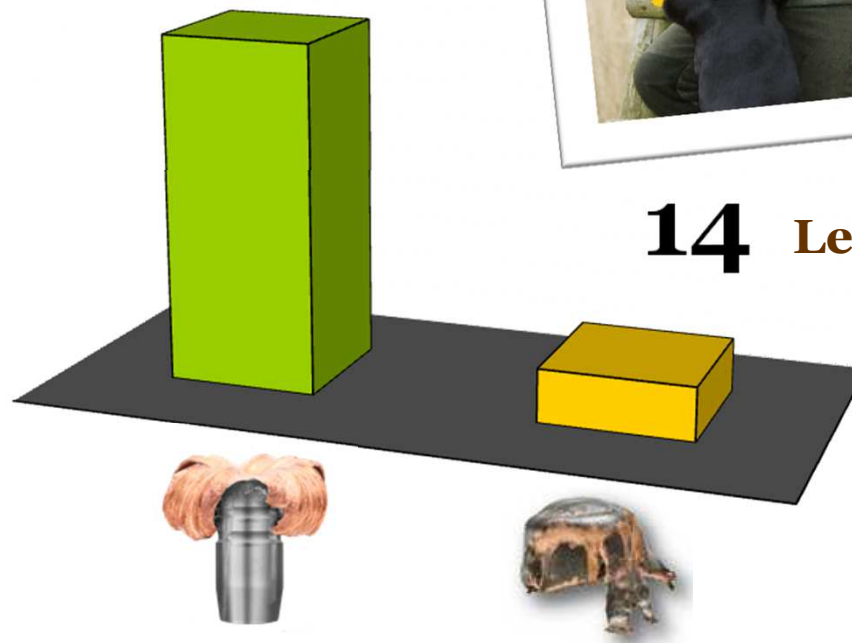
A season's bag
(2013-2014)

Wild Boar	62
Roe Deer	13
Fallow Deer	8
Fox	7
Sika Deer	7
Red Deer	5
Chamois	2
Marten	1
TOT	105

"At present,
the best
answer to the
needs of the
eco-friendly
hunter..."



Lead Free **91**



Lead free ammo: 86,7%

Vittorio Taveggia (Sport Shooter and Hunter)

Last 3 years harvest
with lead-free bullets
(2011-2014)

Roe Deer	29
Wild Boar	20
Mouflon	7
Red Deer	5
Fallow Deer	3
Fox	3
Chamois	1
TOT	68



Lead free ammo: circa 70%



"Pros:
accuracy, high
controlled deformation,
exit wound, clean kill..."

"Cons:
more barrel fouling,
weight retention in
case of ricochet..."

NATURAL REGIONAL PARK OF "GOLA DELLA ROSSA E DI FRASASSI" (CENTRAL ITALY)



YEAR	Hit Wild Boar	Wounded Wild Boar	Killed Wild Boar
2012	368	27	341
2013	346	55	291
2014	522	45	477
TOT	1236	127	1109

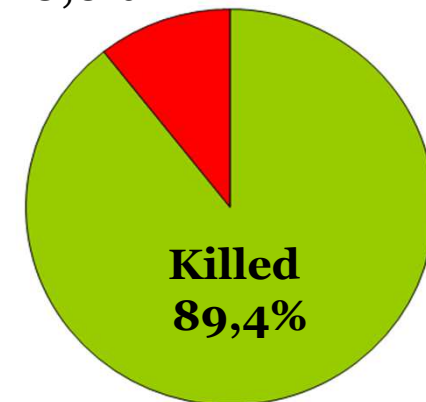
	Killed Wild Boar	Wounded Wild Boar
	92,7%	7,3%
	84,1%	15,9%
	91,4%	8,6%
Average	89,4%	10,6%

**1156 WildBoar culled
with lead-free ammunition**

"Analysis of the data shows a great efficiency and effectiveness of the copper bullets used." *

*(Parco Naturale Regionale della Gola della Rossa e di Frasassi ANALISI DEI PARAMETRI PERTINENTI AL CONTROLLO DIRETTO DI CINGHIALE CON SPARO -TRIENNIO 2012/2014)

Wounded
10,6%



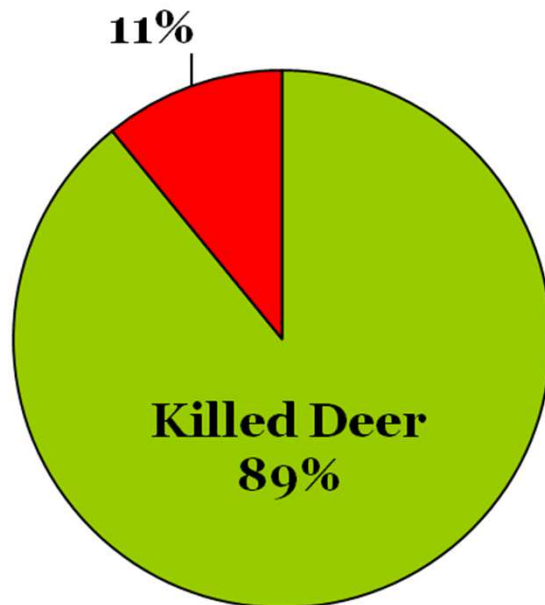
STELVIO NATIONAL PARK (LOMBARDY - ITALY)

YEAR	Fired Deer	Hit Deer	Missed Deer	Wounded Deer	Killed Deer
2012/13 (free choice: almost only lead ammo)	127	101	26	11	90
2014 (mandatory: exclusively lead-free ammo)	256	208	48	28	180



NATIONAL
PARK
STILFSE
R JOCH

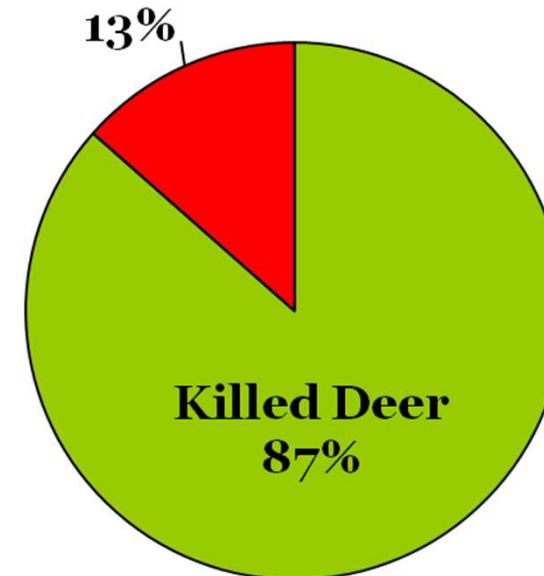
Wounded Deer



2012/13

Almost only **LEAD AMMO**

Wounded Deer



2014

Exclusively **LEAD-FREE AMMO**

STELVIO NATIONAL PARK (LOMBARDY - ITALY)

SHOT PLACEMENT AND "KILLING POWER"

LEAD-FREE BULLETS	Needed shots	
SHOT PLACEMENT	1 SHOT	2 OR MORE
Heart-lung area	129	4
Head/Neck	24	-
Stomach/Intestines	21	26
Grazing shot	1	9
Thigh	1	1
Indeterminate	2	1

LEAD BULLETS	Needed shots	
SHOT PLACEMENT	1 SHOT	2 OR MORE
Heart-lung area	95	5
Head/Neck	19	-
Stomach/Intestines	19	18
Grazing shot	-	10
Thigh	-	-
Indeterminate	3	-



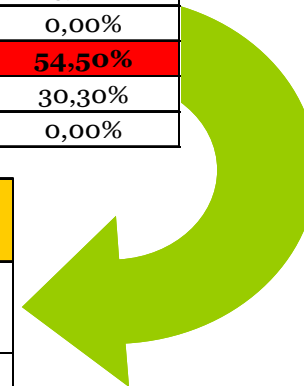
SHOT PLACEMENT AND "KILLING POWER" ON PERCENTAGE

LEAD-FREE BULLETS	Needed shots	
SHOT PLACEMENT	1 SHOT	2 OR MORE
Heart-lung area	73.3%	10,00%
Head/Neck	13,60%	0,00%
Stomach/Intestines	11,90%	65,00%
Grazing shot	0,60%	22,50%
Thigh	0,60%	2,50%

LEAD BULLETS	Needed shots	
SHOT PLACEMENT	1 SHOT	2 OR MORE
Heart-lung area	71,40%	15,20%
Head/Neck	14,30%	0,00%
Stomach/Intestines	14,30%	54,50%
Grazing shot	0,00%	30,30%
Thigh	0,00%	0,00%

NATIONAL
PARK
STILFSE
R JOCH

	LEAD-FREE BULLETS	LEAD BULLETS
1 SHOT 1 KILL (Heart-lung area)	73,30%	71,40%
TROUBLES (Stomach/Intestines)	65,00%	54,50%



**Ultimate is the shot placement!
Lead or not ...**

CONCLUSIONS

Lead-free means:

- o hunting (terminal ballistics) efficiency
- o more precious meat
- o environmental benefits

Why not?



www.barnesbullets.com



Thanks for your attention!