

**THE  
EUROPEAN BOWHUNTERS ASSOCIATION**

**Evaluation of  
The Danish Bowhunters Association  
The Danish National Forest and Nature Agency's**

**Statistics on  
Roedeer (Capreolus Capreolus)  
shot with bow and arrow in Denmark**

**Between 1 October 1999 –15 January 2004**

## **Introduction**

This five year study resulted in the permanence of the bowhunting legislation in Denmark as of January 2005.

This study is based on reports by the bowhunters who have shot at roedeer. In accordance with paragraph §16 of the legislation governing hunting with bow and arrow, all bowhunters are obliged to submit a “game report” describing the number and species of game harvested during the hunting season/period.

The National Forest and Nature Agency send the game report questionnaire to all bowhunters during February-March each year. The questionnaire must be answered and re-submitted no later than 1 May the same year. When individual reports are not submitted, the Agency may withdraw that hunter’s permit to continue bowhunting.

In addition to the general game report, which applies to all species of game, each bowhunter who harvests a Roedeer (*Capreolus Capreolus*) is required to fill-in a special report sheet. (Appendix 1). These are compiled for use in future evaluations of the bow’s efficiency as a tool for hunting roe deer. The return of these reports is fulfilled to 99,4%.

These reports are compared with the reports filed by the keepers of Danish tracking dogs who are required to be called-out in cases of suspected deer woundings and to file independent reports on their tracking results.

The first mandatory bowhunting courses were held together with the theoretical (written) and practical (shooting proficiency) tests in the fall of 1999, all in accordance with the new legislation governing the bow hunt.

## **Summary**

In all, during the period, 99-04: 576 arrows were released at roedeer. 561 of these shots are documented as a hit. In total, 533 roedeer were harvested, which forms the basis for the following statistics.

On eleven occasions, the arrows released missed the deer completely with no evidence of impact. This assumption was substantiated by the total lack of blood or bodily fluids on the recovered arrows.

In four (4) cases was there no evidence of wounding nor was the arrow found.

In 28 cases (4,99%) was evidence of a hit documented either by bodyfluids found on the ground or on the arrow and considered a wounding. This correlates well with other means of harvesting roedeer in Europe.

## Number of Bowhunters that have killed roedeer

Hunting period	Total number of Bowhunters	Number of hunters that have shot deer	Percentage of total no of bowhunters
1999/2000	176	39	22,2%
2000/2001	250	70	28,0%
2001/2002	347	66	19,0%
2002/2003	398	73	18,3%
2003/2004	454	85	18,7%

About 20% of the hunters were successful. Still there are an increasing number of hunters that choose the bow and arrow as their hunting tool. We speculate that the same reasons that drive anglers toward fishing with flyrods work on bowhunters.

## Number of shots at deer

Hunting period	Killed deer	Arrows that missed	Wounded deer*	Total
1999/2000	66	3	1	70
2000/2001	106	1	4	111
2001/2002	101	1	8	111
2002/2003	126	1	8	135
2003/2004	134	5	10	149
1999/2004	533	11	32	576

\* In 28 cases was evidence of a hit documented either by bodyfluids found on the ground or on the found arrow.

In four (4) cases was there no evidence of wounding nor was the arrow found, these are included in the Wounded deer according to Danish National Forest and Nature Agency's policy.

Eleven shots are documented by the lack of blood or other bodily fluids either on the ground or the recovered arrow as clean misses.

Hunting Period	Deer shot at	Killed deer	Misses	Wounded deer	Wounding %*
1999/2000	70	66	3	1	1,49 %
2000/2001	111	106	1	4	3,64%
2001/2002	111	101	1	9	8,18%
2002/2003	135	126	1	8	5,97%
2003/2004	149	134	5	10	6,94%
1999/2004	576	533	11	32 (28)	5,66% (4,99%)

The follow up of this five year study have resulted in an increased minimum energy level when the hunter chooses to hunt with a mechanical-expandable hunting head or blunt. The new minimum for the arrows kinetic energy is 70 Joules.

#### Hunting method in relation to shots taken

Hunting period	Still hunting	Drive	Groundblind	Treestand
1900/2000	24	22	14	10
2000/2001	31	19	29	32
2001/2002	41	20	17	33
2002/2003	47	18	31	39
2003/2004	59	17	28	45
1999/2004 (576)	202	96	119	159

#### Bow type in relation to shots taken

Bow type	Compound	Recurve	Longbow
Number of roedeer (576)	565	6	5

Only 2% of the hunters choose a “traditional” bow this is slightly lower than US statistics, this might be a result of a very demanding proficiency test that stipulates five of six arrows to hit within the vital area of game targets ranging from roedeer to pheasant in size at unknown distances up to 25 meters.

#### Shooting distance in relation to shots taken

Distance in metres	0 to 10	11 to 15	16 to 20	21 to 30
Number of roedeer (576)	109	153	183	131

Most shots (77,2%) is taken at a distance of 20 meters or less this correlates to studies made in North America for bowhunters on white-tailed deer

#### Angle of shot in relation to shots taken

Angle	Broadside	Quartering towards	Quartering away	Frontal shot
Number of roedeer (576)	454	79	43	2

The majority of the shots (78,8%) was taken at broadside deer. Quite few were shot at in quartering toward situation (13,7%). This is a shot angle that most bowhunting literature refer

to as “low percentage shot” and may be the reason for some of the wounding. Very few shots (7,5%) are taken in the “quartering away” position, this is what international experts refer to as the “most lethal shot” with a hunting arrow.

#### Deer movement at shot moment

Type of movement	Standing still	Walking	Trotting	Galloping	Movement at release
No. roedeer	491	79	1	0	5

#### Distance to recovery, measured in metres from place of impact to place of immobility

Distance metres	0	0 to 25	25 to 50	50 to 100	+100
No. Roedeer (533)	87	199	180	50	17

In 87,4% of the cases the deer was recovered within 50 meter, a figure that correlates well with rifle hunting.

#### Degree of arrow penetration

Penetration degree	Arrow passed through completely	Full broadhead penetration with arrow remaining in deer	Partial broadhead penetration.
Number of roedeer (555)	485	60	10

In 87,4% of the cases did the arrow pass completely through the body cavity of the deer. In 10,8% of the cases did the broadhead pass through the deer with the remainder of the arrow in the deer. In 1,8% of the cases did the broadhead not pass entirely through the deer. The figures indicate strongly that the stipulated kinetic energy of 40 joules is by a wide margin enough for shots at roedeer.

Above figures are based on subsequently found arrows that showed evidence of a pass through.

#### Organs penetrated by broadhead on roedeer taken.

Organs affected	Heart/lungs	Liver	Belly	Neck/spine	Hams
Number of shots (533)	456	30	8	37	2

In some instances the arrow impacted more than one of the above areas. In these cases, the hit has been designated to the most lethal category. Example: An arrow penetrating both the liver and belly has been designated as a liver hit.

85,6% of the cases was the intended target area hit.

#### Wounding of bow-shot roedeer

A total of 576 arrows released at roedeer were reported.

In eleven (11) instances it is assumed the arrow missed the animal. This was substantiated by the fact that no traces of blood or bodily fluids were found on the recovered arrows.

In four cases was no blood or the arrow found. These four are considered “wounded deer“ by the Agency.

The data in this study is cross-checked with data from the Danish Tracking Dog team reports.

In four cases, a tracking dog was summoned with the following results:

Two deer were found 30 and 150 metres, respectively from the place of arrow impact.

One deer was not found by the dog, but was found dead the following day, 130 metres from the place of arrow impact.

One deer was never found.

On one occasion, a deer was wounded by an arrow impact high in the back. The animal was paralysed and fell on the spot. It was subsequently dispatched with a knife. This deer is included in the wounded deer numbers.

Conclusion: of 561 roedeer known to be hit, 28 was categorized as wounded.

A total wounding rate of 4,99% correlating well with other means of harvesting roedeer in Europe.

Anders Gejer and Richard Cadwalader, European Bowhunting Association