

**THE
EUROPEAN BOWHUNTERS ASSOCIATION**

**Evaluation of
The Danish Bowhunting 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 permanent ratification of Denmark's bowhunting legislation as of January 2005.

This study is based on reports by submitted by all licensed bowhunters who 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 sends game report questionnaires to all licensed 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. These completed reports are returned by 99.4% of all participants.

These reports are then compared with the reports filed by the keepers of Danish tracking dogs who are required to be called-out in cases of suspected deer wounding 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 hits. 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 there was no evidence of wounding, nor was the arrow found.

In 28 cases (4.99%) evidence of a hit was indicated either by bodily fluids found on the ground or on the arrow. Due to this evidence, these 28 cases were considered to be wounding. This percentage compares favorably 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 over the years. Still there are an increasing number of hunters that choose the bow and arrow as their hunting tool. We speculate that the same mind-set that compels anglers to fish with flyrods is also at 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, evidence of a hit was documented either by bodily fluids found on the ground or on the retrieved arrow. In four (4) cases there was no evidence of wounding nor was the arrow found, these cases are listed as Wounded deer in accordance with the Danish National Forest and Nature Agency's policy.

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

Number of shots at roe-deer.

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 has resulted in an increased minimum energy level when the hunter chooses to hunt with mechanical-expandable hunting heads or blunts. The new minimum kinetic energy required for these arrows 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 roe-deer (576)	565	6	5

Only 2% of the hunters choose a “traditional” bow, which is slightly lower than US statistics. This might be the result of Denmark’s very demanding proficiency test that stipulates that five of six arrows must hit within the vital area of game targets ranging from roe deer 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 roe-deer (576)	109	153	183	131

The majority of the shots (78.8%) were taken at broadside deer. Quite a few were shot at in “quartering toward” situations (13.7%). This is an angle that most bowhunting literature refers to as “low percentage shot” and may be the reason for some of the woundings. Very few shots (7.5%) were taken in the “quartering away” position, this is what international experts refer to as the “most lethal shot” with a hunting arrow.

Angle of shot in relation to shots taken

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

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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 were recovered within 50 meters, 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 the arrow passed completely through the body cavity of the deer. In 10.8% of the cases the broadhead passed through the deer while the arrow remained in the deer. In 1.8% of the cases the broadhead did not pass entirely through the deer. These figures strongly indicate that the stipulated kinetic energy of 40 joules is more than adequate for harvesting roedeer.

The figures above are based on subsequently found arrows that showed evidence of a pass through on both found and unrecovered deer.

Organs penetrated by broadhead on roedeer taken.

Organs affected	Heart/lungs	Liver	Abdomen	Neck/spine	Hindquarters
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.

In 85.6% of the cases the intended target area was hit.

Wounding of bow-shot roe-deer

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 retrieved arrows.

In four (4) cases no blood or arrows were 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 meters 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 paralyzed 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 are known to have been hit. Twenty-eight (28) were categorized as wounded.

A total wounding rate of 4.99% resulted over the five-year hunting period. This percentage compares favorably with other means of harvesting roe-deer in Europe.

Anders Gejer and Richard Cadwalader, European Bowhunting Association May 2005