

Inbreeding in Dutch dairy cattle

For six groups of female animals average inbreeding per year of birth is given in tables and graphs:

1. female animals having genes from the Dutch Friesian and/or Holstein Friesian breed, black&white and red&white animals
2. female animals which are pure (100%) Holstein Friesian, black&white and red&white animals
3. female animals which are pure (100%) Dutch Friesian (Fries Hollands)
4. female animals which are pure (100%) MRIJ
5. female animals which are pure (100%) Holstein Friesian, black&white animals
6. female animals which are pure (100%) Holstein Friesian, red&white animals

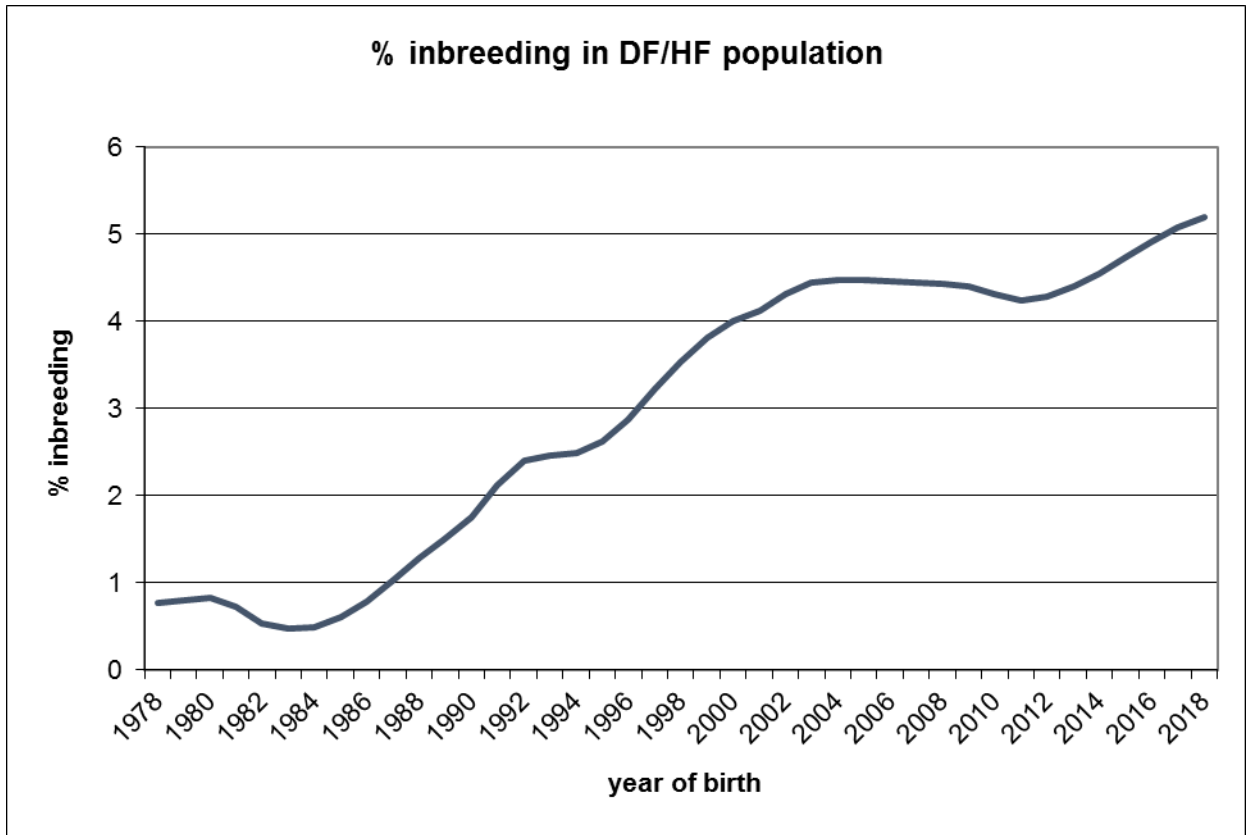
Note that the level of inbreeding depends on the amount of pedigree which is available for animals in the population. For the first years of birth there is limited information on ancestry on many animals.

Group 1

Table 1. Percentage inbreeding in animals per year of birth. Animals have genes from the Dutch Friesian and/or Holstein-Friesian breed, black&white and red&white animals.

birthyear	% inbreeding
1978	0,77
1979	0,80
1980	0,83
1981	0,72
1982	0,53
1983	0,47
1984	0,49
1985	0,61
1986	0,79
1987	1,04
1988	1,28
1989	1,50
1990	1,75
1991	2,12
1992	2,40
1993	2,46
1994	2,49
1995	2,62
1996	2,87
1997	3,22
1998	3,54
1999	3,81
2000	4,00
2001	4,13
2002	4,32
2003	4,44
2004	4,48
2005	4,47
2006	4,46
2007	4,45
2008	4,43
2009	4,40
2010	4,32
2011	4,24
2012	4,28
2013	4,41
2014	4,55
2015	4,74
2016	4,92
2017	5,08
2018	5,20

Graph 1. Percentage inbreeding in animals per year of birth. Animals have genes from the Dutch Friesian and/or Holstein-Friesian breed.

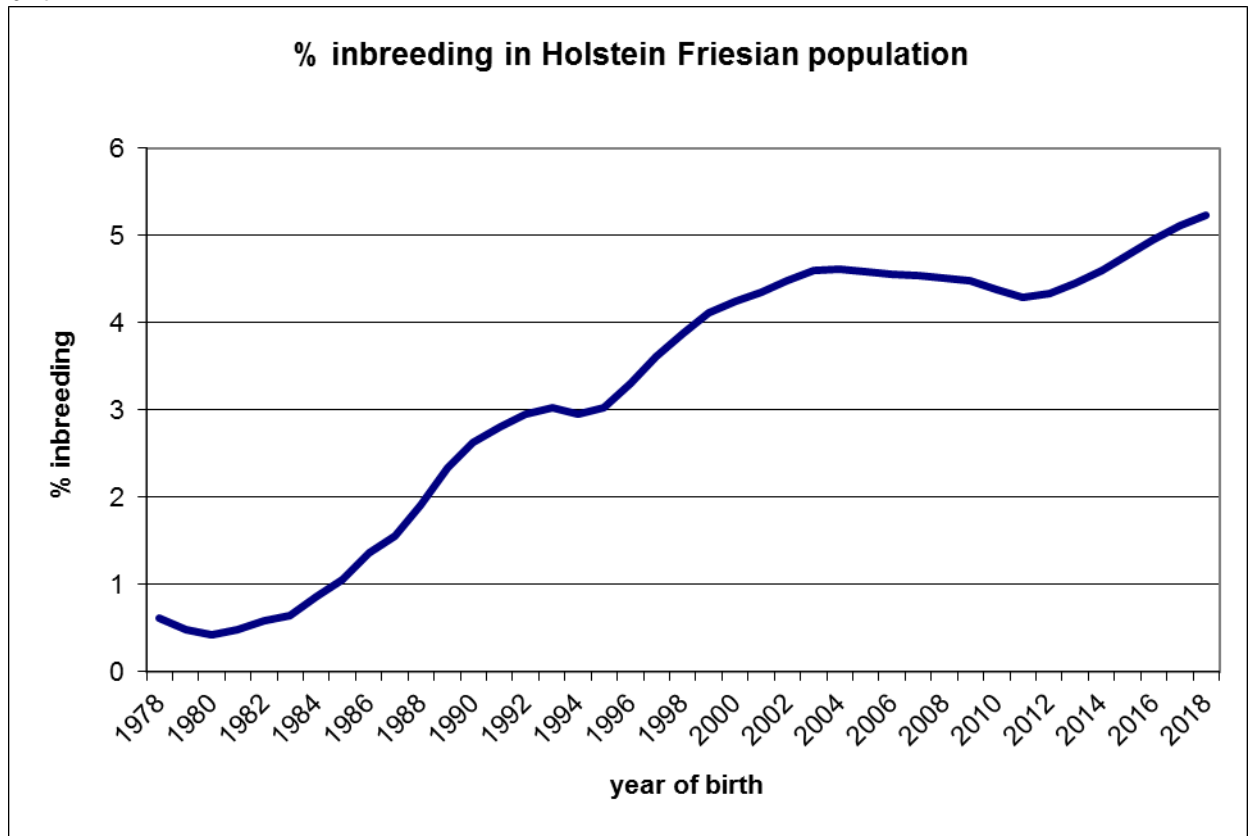


Group 2

Table 2. Percentage inbreeding in pure (100%) Holstein-Friesian animals per year of birth, black&white and red&white animals.

birthyear	% inbreeding
1978	0,61
1979	0,48
1980	0,42
1981	0,48
1982	0,58
1983	0,65
1984	0,87
1985	1,05
1986	1,36
1987	1,56
1988	1,91
1989	2,33
1990	2,63
1991	2,81
1992	2,96
1993	3,03
1994	2,96
1995	3,03
1996	3,30
1997	3,62
1998	3,88
1999	4,12
2000	4,25
2001	4,35
2002	4,49
2003	4,60
2004	4,61
2005	4,59
2006	4,56
2007	4,54
2008	4,51
2009	4,48
2010	4,38
2011	4,29
2012	4,33
2013	4,45
2014	4,60
2015	4,78
2016	4,96
2017	5,11
2018	5,24

Graph 2. Percentage inbreeding in pure (100%) Holstein-Friesian animals per year of birth.

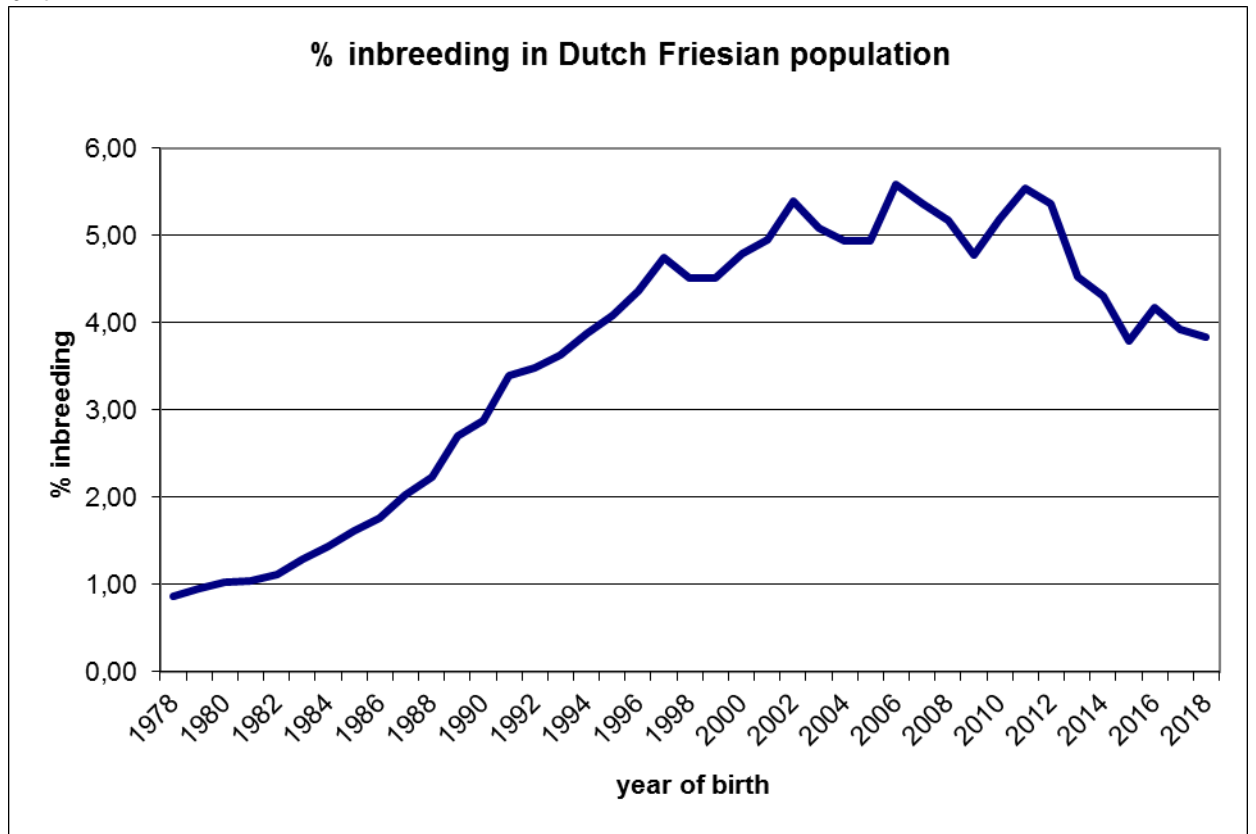


Group 3

Table 3. Percentage inbreeding in pure (100%) Dutch Friesian animals per year of birth, black&white and red&white animals.

<u>birthyear</u>	<u>% inbreeding</u>
1978	0,87
1979	0,95
1980	1,03
1981	1,04
1982	1,12
1983	1,29
1984	1,44
1985	1,62
1986	1,76
1987	2,02
1988	2,24
1989	2,71
1990	2,88
1991	3,40
1992	3,48
1993	3,63
1994	3,88
1995	4,08
1996	4,36
1997	4,75
1998	4,51
1999	4,52
2000	4,80
2001	4,95
2002	5,39
2003	5,09
2004	4,94
2005	4,94
2006	5,58
2007	5,36
2008	5,17
2009	4,78
2010	5,19
2011	5,54
2012	5,37
2013	4,53
2014	4,30
2015	3,79
2016	4,18
2017	3,92
2018	3,84

Graph 3. Percentage inbreeding in pure (100%) Dutch Friesian animals per year of birth.

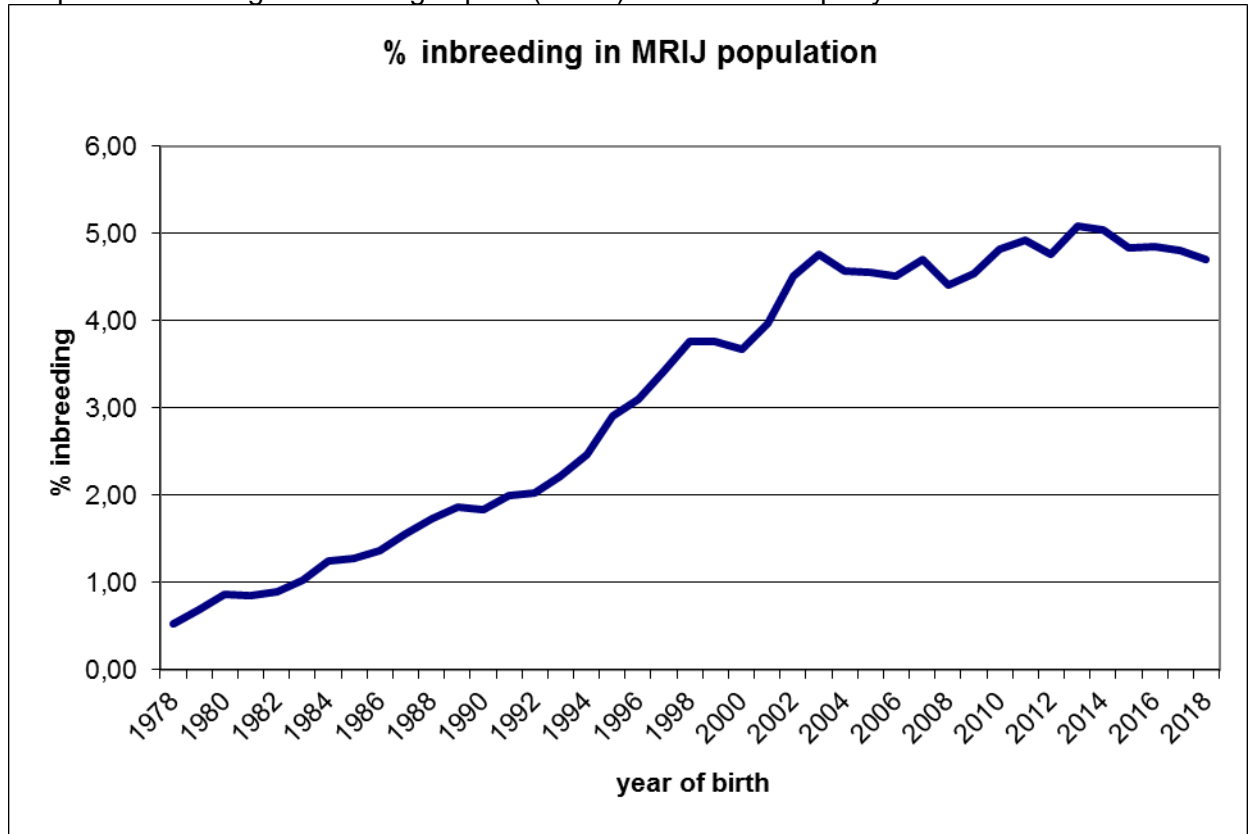


Group 4

Table 4. Percentage inbreeding in pure (100%) MRIJ animals per year of birth.

<u>birthyear</u>	<u>% inbreeding</u>
1978	0,52
1979	0,69
1980	0,86
1981	0,85
1982	0,89
1983	1,02
1984	1,24
1985	1,28
1986	1,37
1987	1,56
1988	1,73
1989	1,86
1990	1,83
1991	1,99
1992	2,03
1993	2,22
1994	2,47
1995	2,91
1996	3,10
1997	3,42
1998	3,77
1999	3,76
2000	3,68
2001	3,97
2002	4,51
2003	4,76
2004	4,57
2005	4,56
2006	4,51
2007	4,71
2008	4,41
2009	4,54
2010	4,82
2011	4,92
2012	4,77
2013	5,09
2014	5,04
2015	4,84
2016	4,85
2017	4,81
2018	4,71

Graph 4. Percentage inbreeding in pure (100%) MRIJ animals per year of birth.

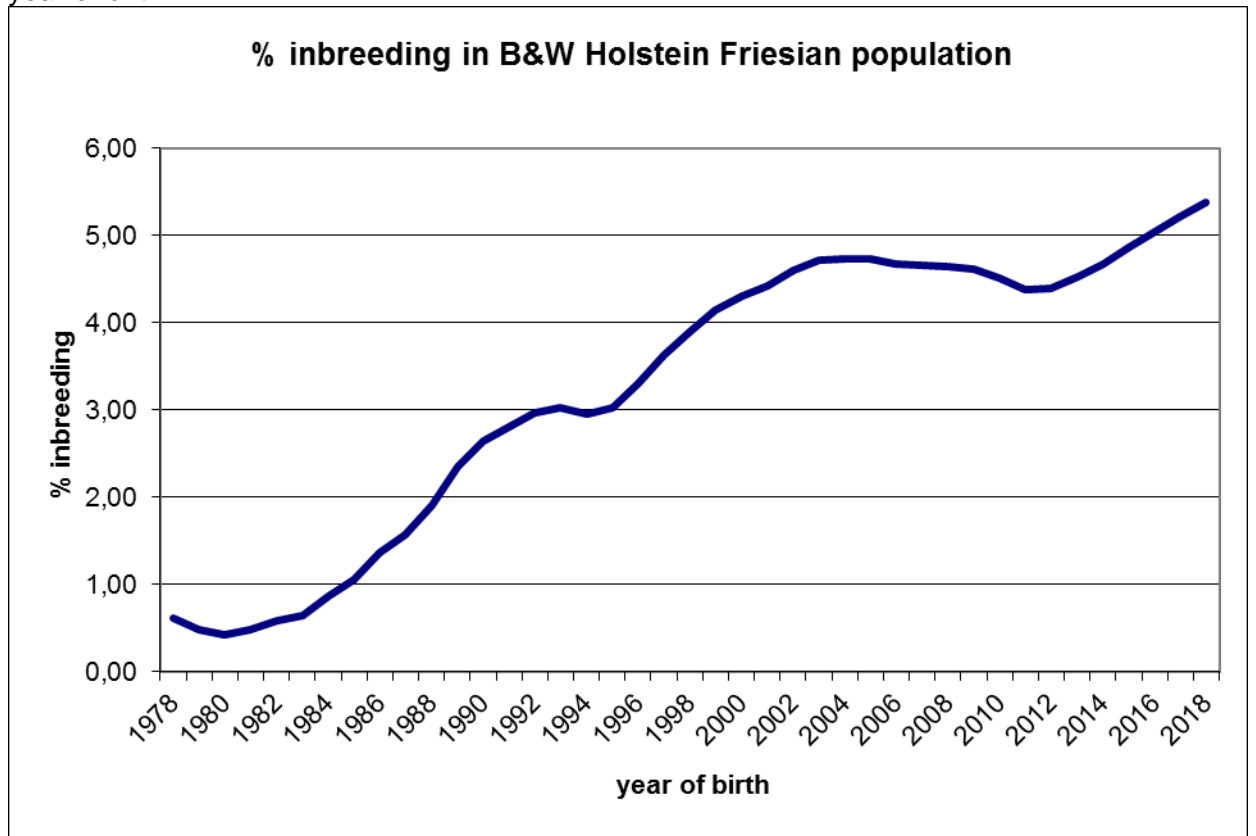


Group 5

Table 5. Percentage inbreeding in pure (100%) Holstein-Friesian animals per year of birth, black&white animals.

<u>birthyear</u>	<u>% inbreeding</u>
1978	0,62
1979	0,48
1980	0,42
1981	0,48
1982	0,58
1983	0,65
1984	0,86
1985	1,06
1986	1,37
1987	1,57
1988	1,91
1989	2,35
1990	2,64
1991	2,81
1992	2,97
1993	3,03
1994	2,96
1995	3,03
1996	3,31
1997	3,63
1998	3,90
1999	4,15
2000	4,31
2001	4,43
2002	4,60
2003	4,72
2004	4,74
2005	4,74
2006	4,68
2007	4,66
2008	4,64
2009	4,61
2010	4,51
2011	4,38
2012	4,40
2013	4,53
2014	4,68
2015	4,86
2016	5,05
2017	5,22
2018	5,38

Graph 5. Percentage inbreeding in pure (100%) B&W Holstein-Friesian animals per year of birth.



Group 6

Table 6. Percentage inbreeding in pure (100%) Holstein-Friesian animals per year of birth, red&white animals.

<u>birthyear</u>	<u>% inbreeding</u>
1978	0,54
1979	0,58
1980	0,30
1981	0,43
1982	0,82
1983	0,49
1984	1,18
1985	0,76
1986	1,05
1987	1,21
1988	1,87
1989	1,99
1990	2,48
1991	2,55
1992	2,72
1993	2,93
1994	3,10
1995	3,07
1996	3,11
1997	3,27
1998	3,23
1999	3,32
2000	3,08
2001	3,00
2002	3,12
2003	3,19
2004	3,25
2005	3,25
2006	3,41
2007	3,50
2008	3,50
2009	3,55
2010	3,59
2011	3,74
2012	3,93
2013	4,07
2014	4,18
2015	4,33
2016	4,45
2017	4,55
2018	4,55

Graph 6. Percentage inbreeding in pure (100%) R&W Holstein-Friesian animals per year of birth.

