Midwest Forage Quality How are we doing?

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Dairyland Laboratories

Dairyland Laboratories, Inc.

Laboratory Locations:

- Arcadia, WI
- Stratford, WI
- St. Cloud, MN
- Lansing, MI

Where do the forage samples orginate from?

42- States	6- Foreign Countries
Wisconsin – 35%	Minnesota – 23%
Iowa – 10%	Canada – 7%
South Dakota – 6%	Illinois – 3%
North Dakota – 2%	

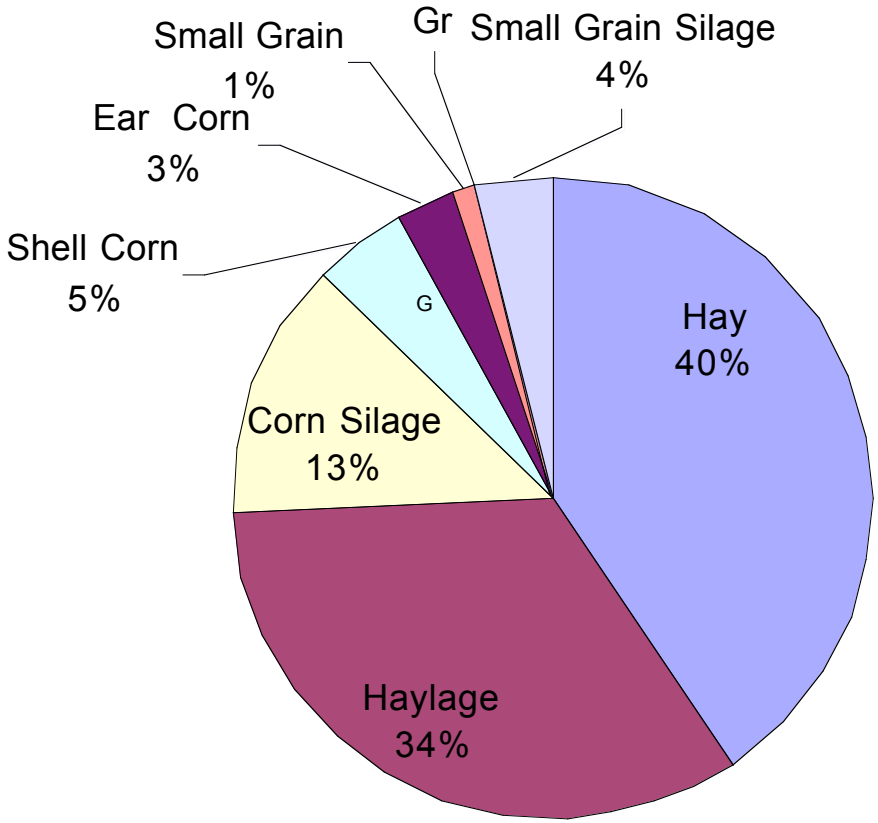
Historical Prospective

a) Types of samples Analyzed

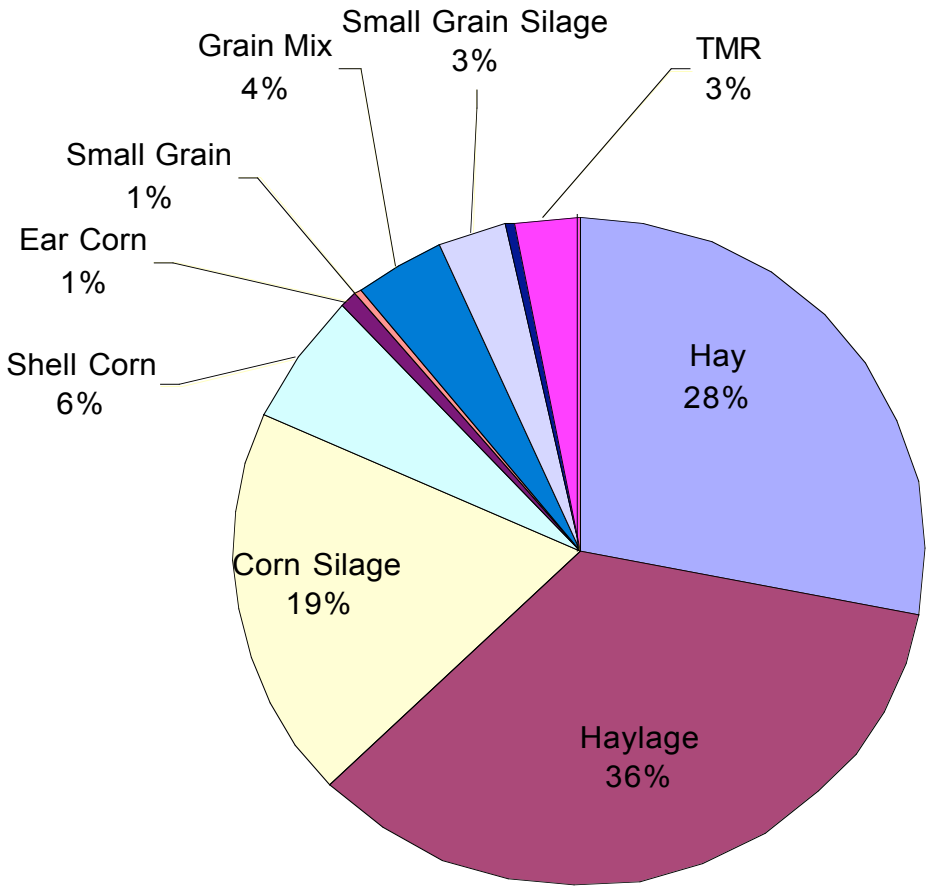
b) Primary Nutritional Fractions -
Moisture, Protein, Fibers, Minerals.

c) Anti Quality Factors
Molds, Yeasts, Mycotoxins
Fermentation Profile.

Forage Type - 1991



Forage Type - 2001



Management Factors
Moisture Content – Corn Silage

	Range	Average	St. Dev.
1995	48-69	59	10.4
1996	54 - 72	63	9.2
1997	43-83	63	10
1998	41 - 80	60	9.8
1999	41 - 80	60.5	9.91
2000	37 - 82	59	11.33
2001	45 - 79	62	8.4
2002	45 - 79	62	8.4

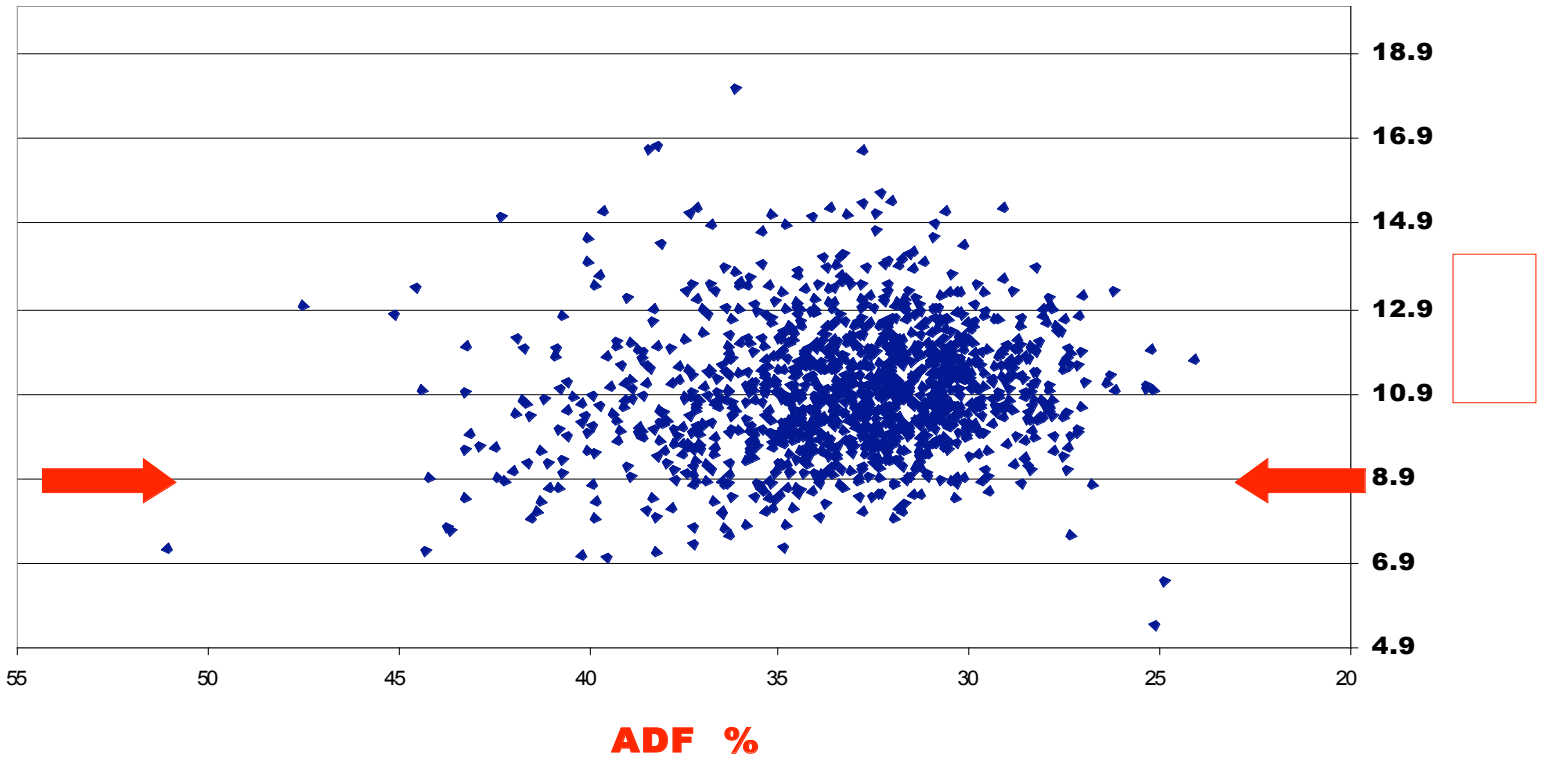
2002 Forage Summaries
Corn Silage

	Range	Average	St. Dev
Crude Protein	6.5 – 11.1	8.81	1.15
NDF	30.3- 53.9	42	5.89
NDFd 48	49 - 71	60	5.62
Lignin	2 – 5	3.6	0.74
Starch	14 - 45	30	7.83
Ash	2.4 – 6.7	4.5	1.08
pH	3.4 – 4.7	4.06	.32

2002 Forage Summaries Haylage

	Range	Average	St. Dev.
Crude Protein	14.5 - 25	19.8	2.62
NDF	31.8 – 54.3	43	5.6
NDFD	24.4 – 60	42	8.89
Lignin	4.53 – 11.1	7.8	1.63
Ash	6.88 – 13.5	10.18	1.65
RFV	92 – 186	139	24
RFQ	73 – 201	137	32

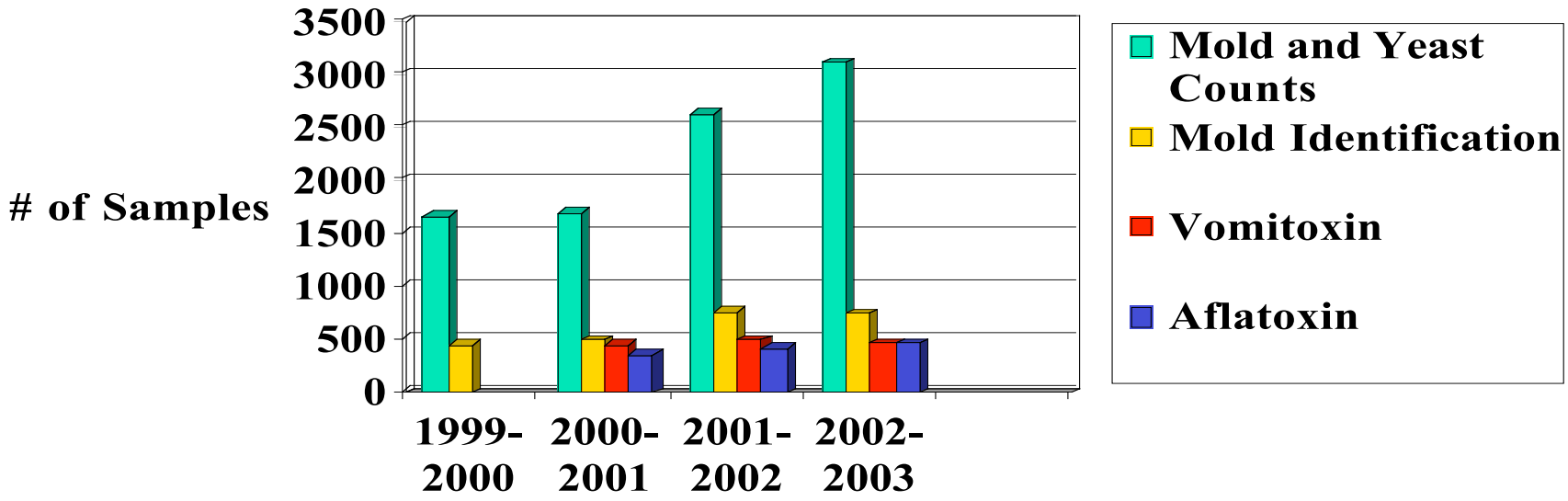
Comparison of actual ash (mean 10.99%) vs. book value (8.9%)
Dairyland Laboratories - Arcadia, WI (1300 Mixed haylage samples 1998)



Chloride Summary

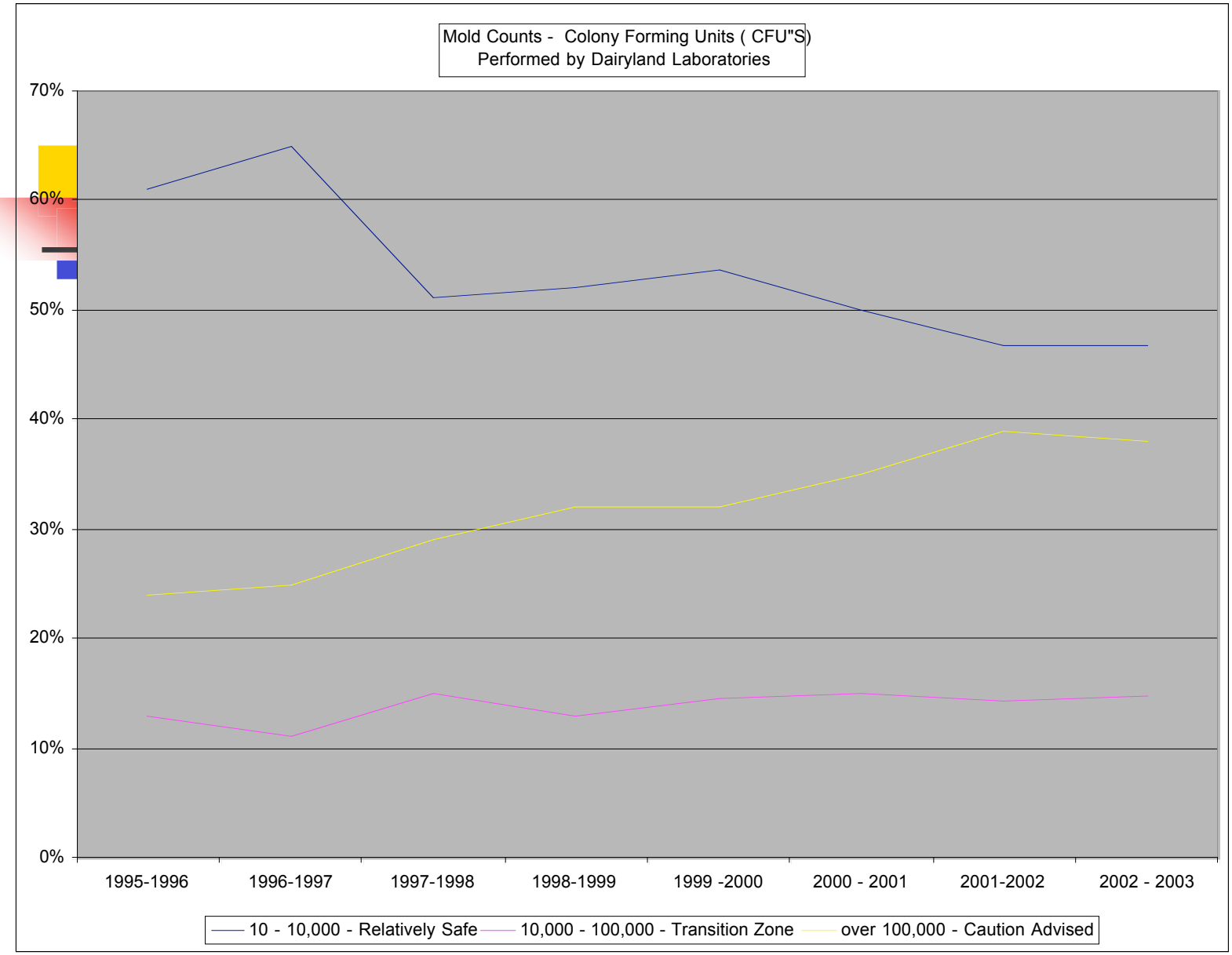
	D.L. Range	D.L. Average	D.L. St.Dev	NRC Average	NRC St.Dev.
Legume Hay	.12 -1.20	.60	.27		
Mixed Hay	.11 -1.25	.57	.34	.74	.39
Grass	.14 - .94	.40	.27		
Legume Haylage	.04 -1.52	.74	.45		
Mixed Haylage	.16- 1.16	.60	.25	.62	.33
Grass Haylage	.16 - .99	.66	.25		

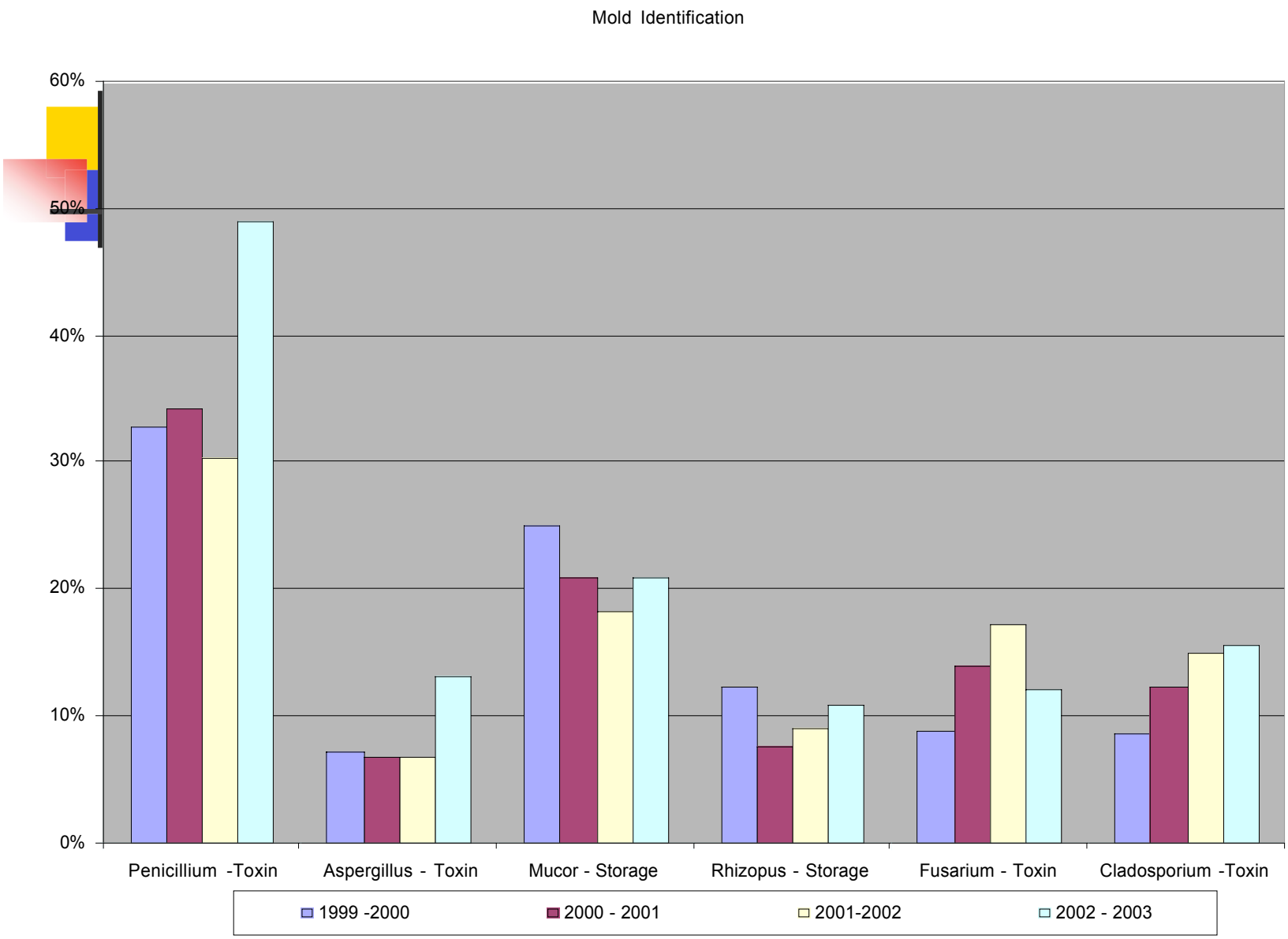
Four Year History
Molds, Mold ID, Mycotoxins



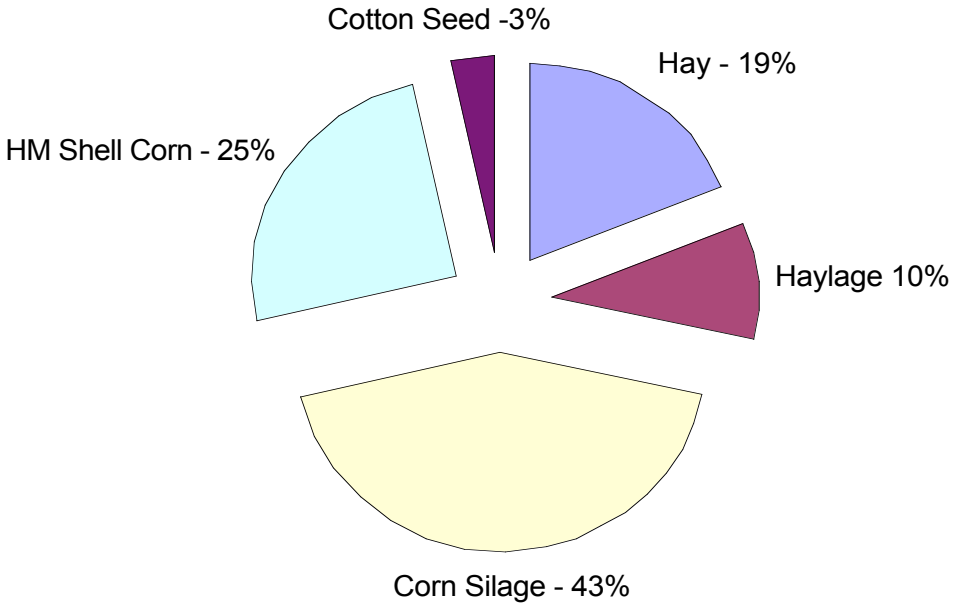
Interpretation Levels for Mold Counts

- 10 – 10,000 CFU's - Relatively Safe
- 10,000 – 100,000 – Transition Zone
- 100,000 – 1,000,000 – Caution Advised
- Over 1,000,000 – Recommended not to feed.

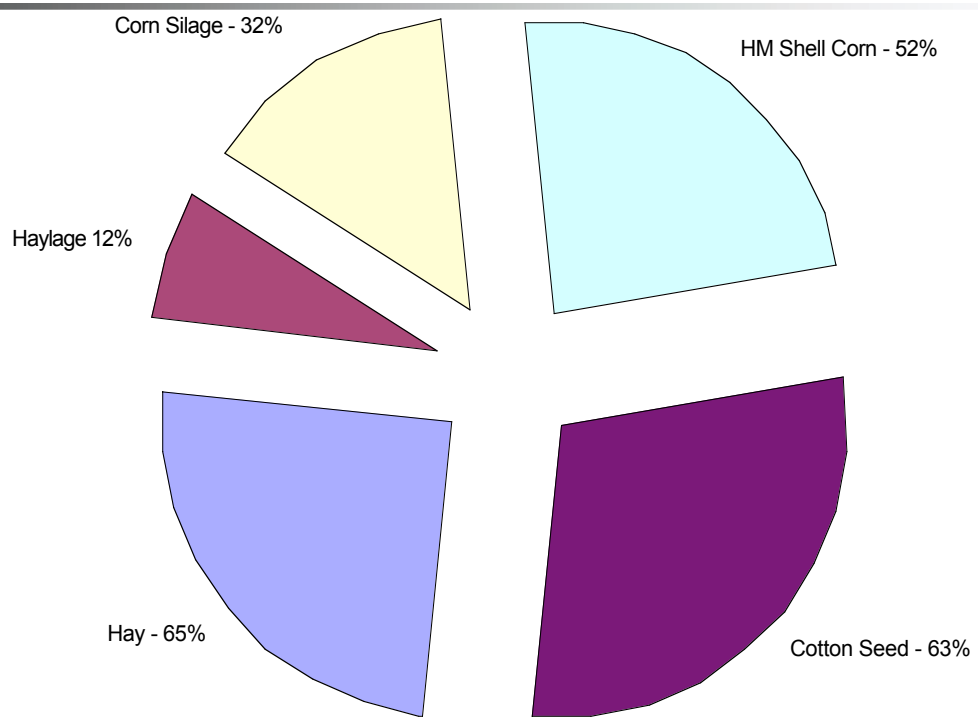

Mold Counts - Colony Forming Units (CFU"S)
Performed by Dairyland Laboratories
70%
60%
50%
40%
30%
20%
10%
0%
1995-1996
1996-1997
1997-1998
1998-1999
1999 -2000
2000 - 2001
2001-2002
2002 - 2003
10 - 10,000 - Relatively Safe
10,000 - 100,000 - Transition Zone
over 100,000 - Caution Advised

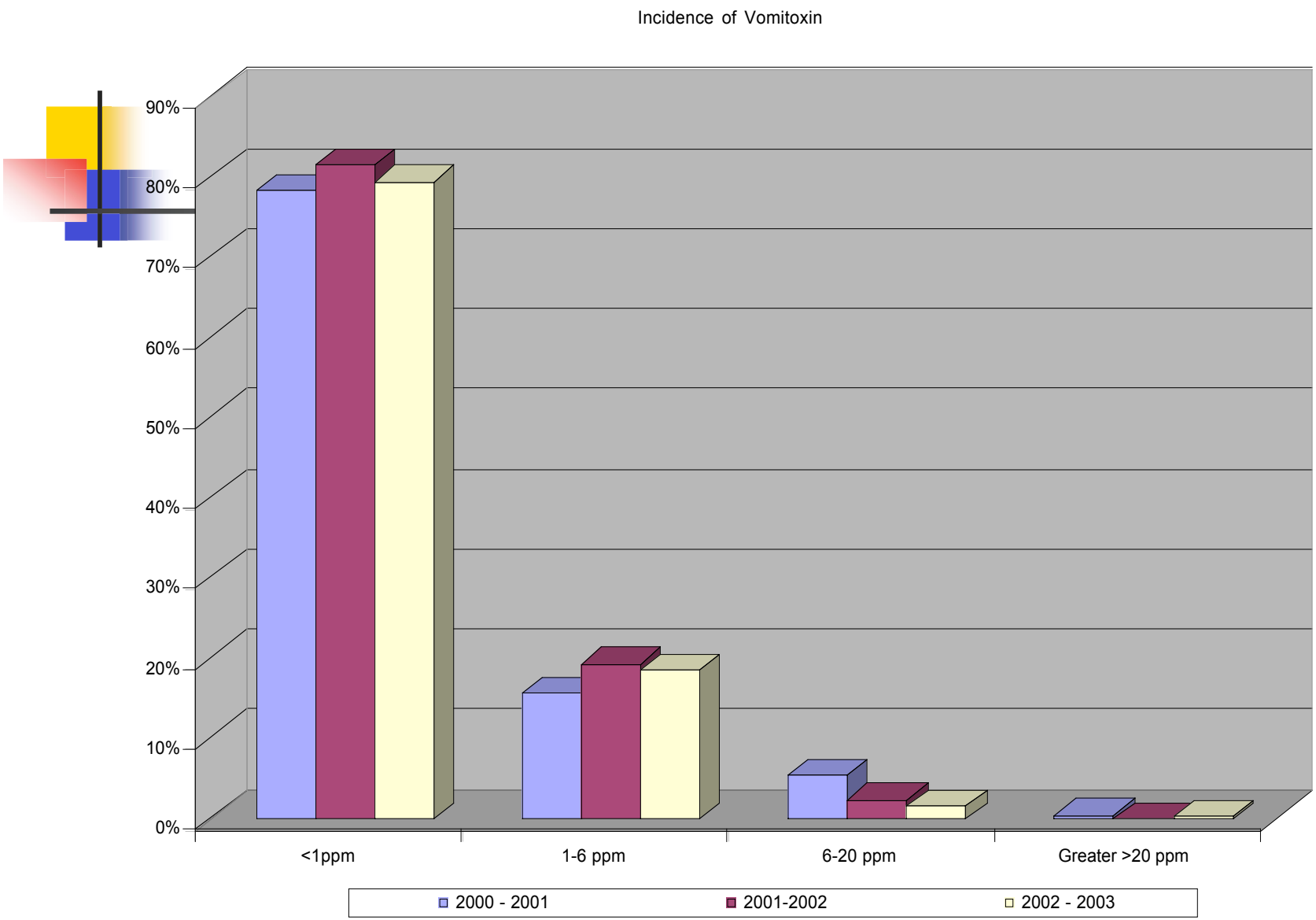

Mold Identification
60%
50%
40%
30%
20%
10%
0%
Penicillium -Toxin
Aspergillus - Toxin
Mucor - Storage
Rhizopus - Storage
Fusarium - Toxin
Cladosporium -Toxin
1999 -2000
2000 - 2001
2001-2002
2002 - 2003

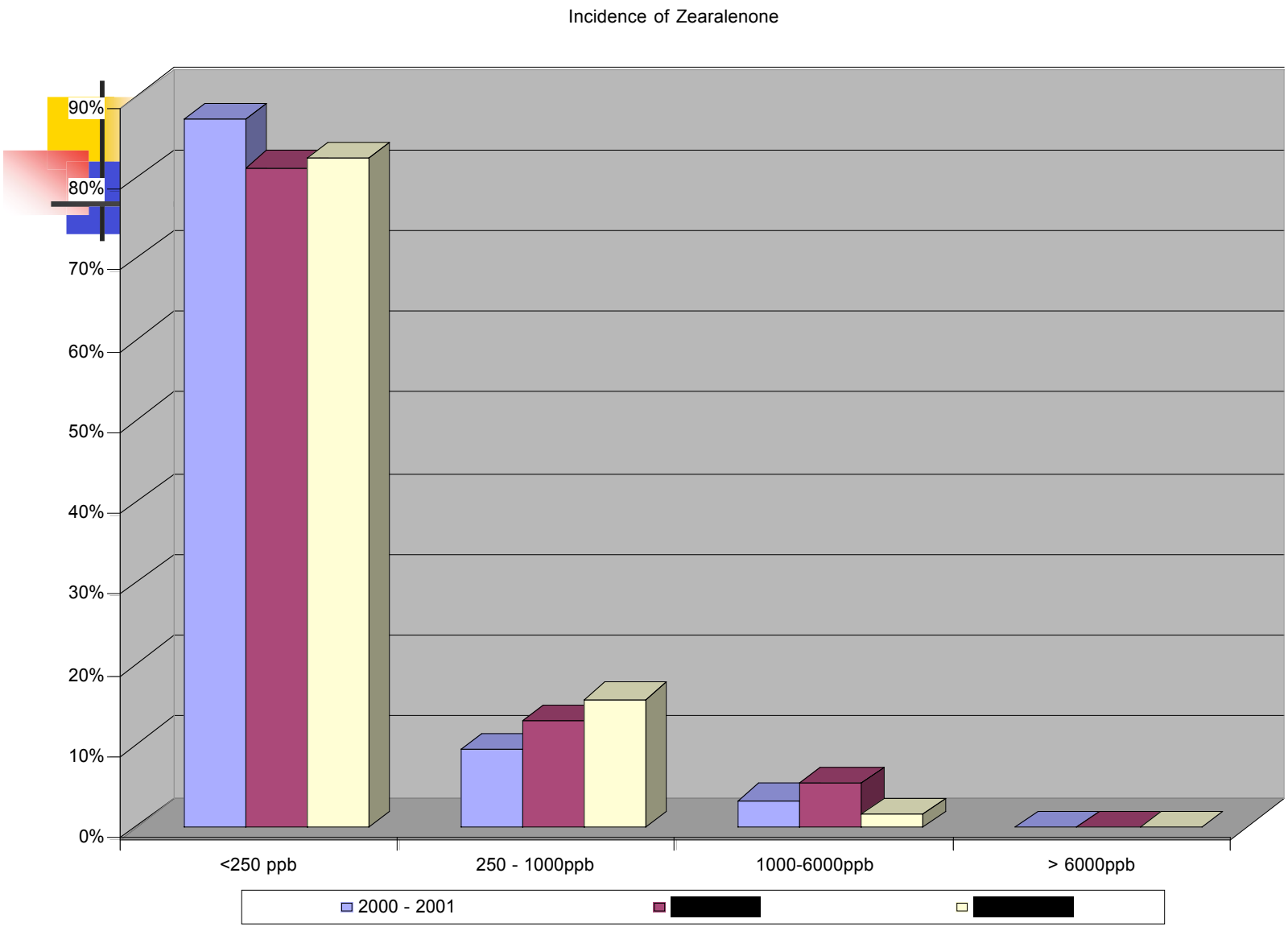
Types of Samples Submitted for Mold Counts
January and February 2003



Mold Counts over 100,000
January and February 2003



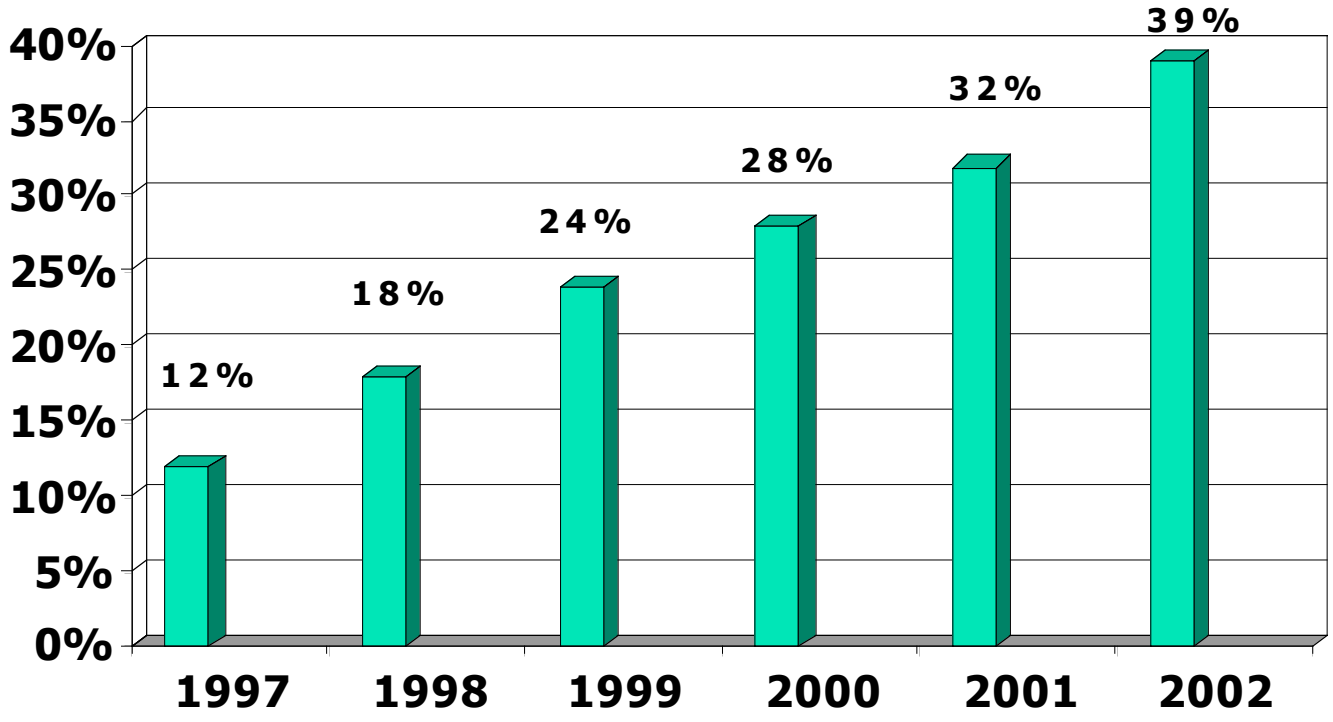

Incidence of Vomitoxin
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
<1ppm
1-6 ppm
6-20 ppm
Greater >20 ppm
2000 - 2001
2001-2002
2002 - 2003


Incidence of Zearalenone
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
<250 ppb
250 - 1000ppb
1000-6000ppb
> 6000ppb
2000 - 2001
[redacted]
[redacted]

NDFD Summaries
Dairyland Laboratories

	Average	Range
Mixed Hay	47	32-62
Legume Hay	46	32-61
Grass Hay	55	38 -73
Mixed Haylage	42	25-60
Legume Haylage	42	25-58
Grass Haylage	61	51-72
Corn Silage	60	48-71

2001 Dairy NRC Energy Prediction as % of Samples.



Percentage of samples tested by NIR.