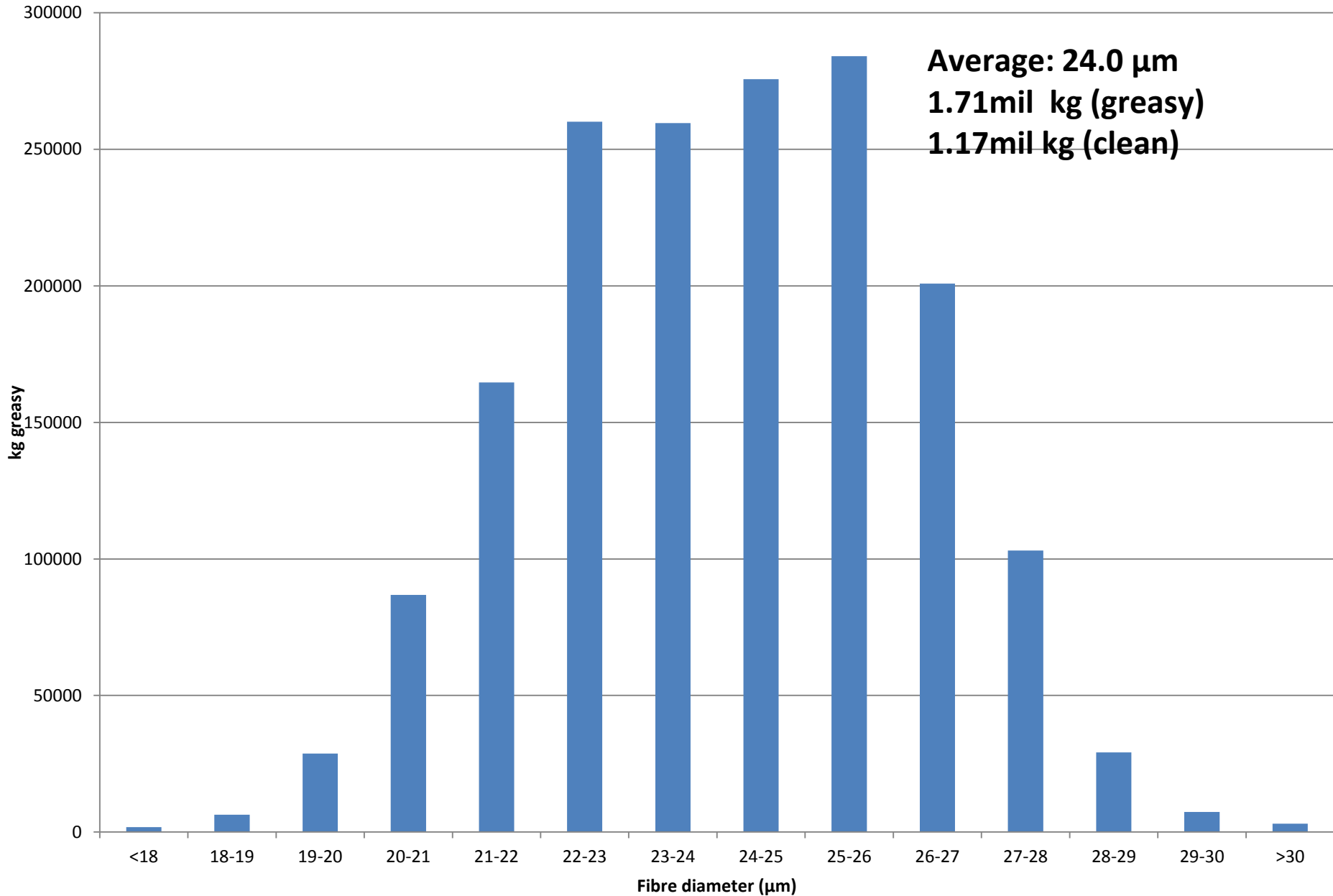
The background of the slide is a close-up photograph of wool fibers, showing their characteristic crimp and texture. Overlaid on this background are several colorful line graphs in shades of blue, red, yellow, green, and purple. These graphs appear to be data plots, possibly representing wool testing results over time or across different samples. The lines are jagged and fluctuate significantly, with some showing a general upward trend. The text is centered over the middle of the image.

2017-18 Wool Testing Results Laserscan and Additional Measurement.....what now?

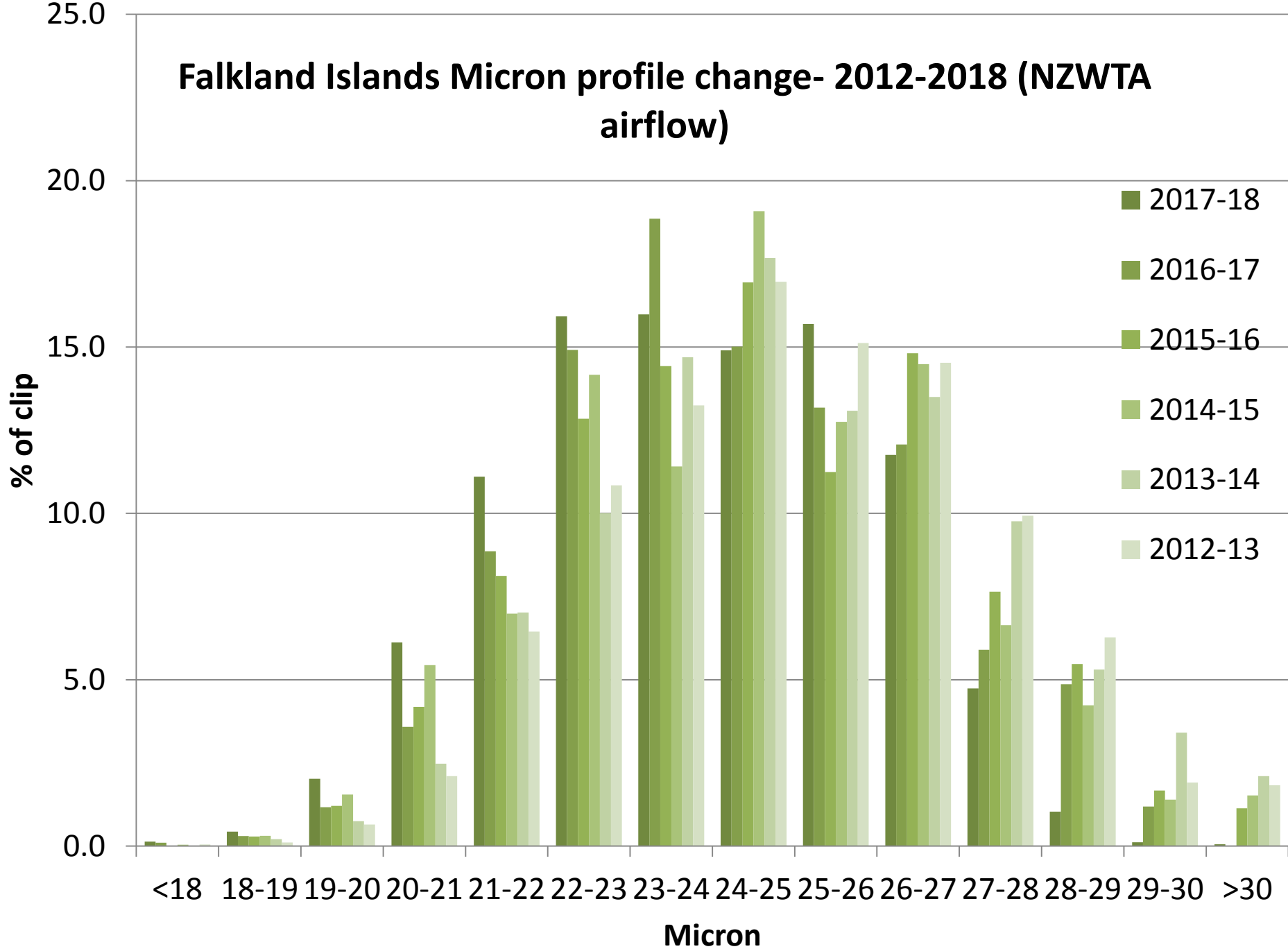
Adam Dawes

- **2017-18 test results (micron)**
- **Laserscan**
 - What is it?
 - Why use it?
 - The approval process
 - The way forward
- **Length and Strength measurement**
 - Results from 17/18 testing
 - Economics

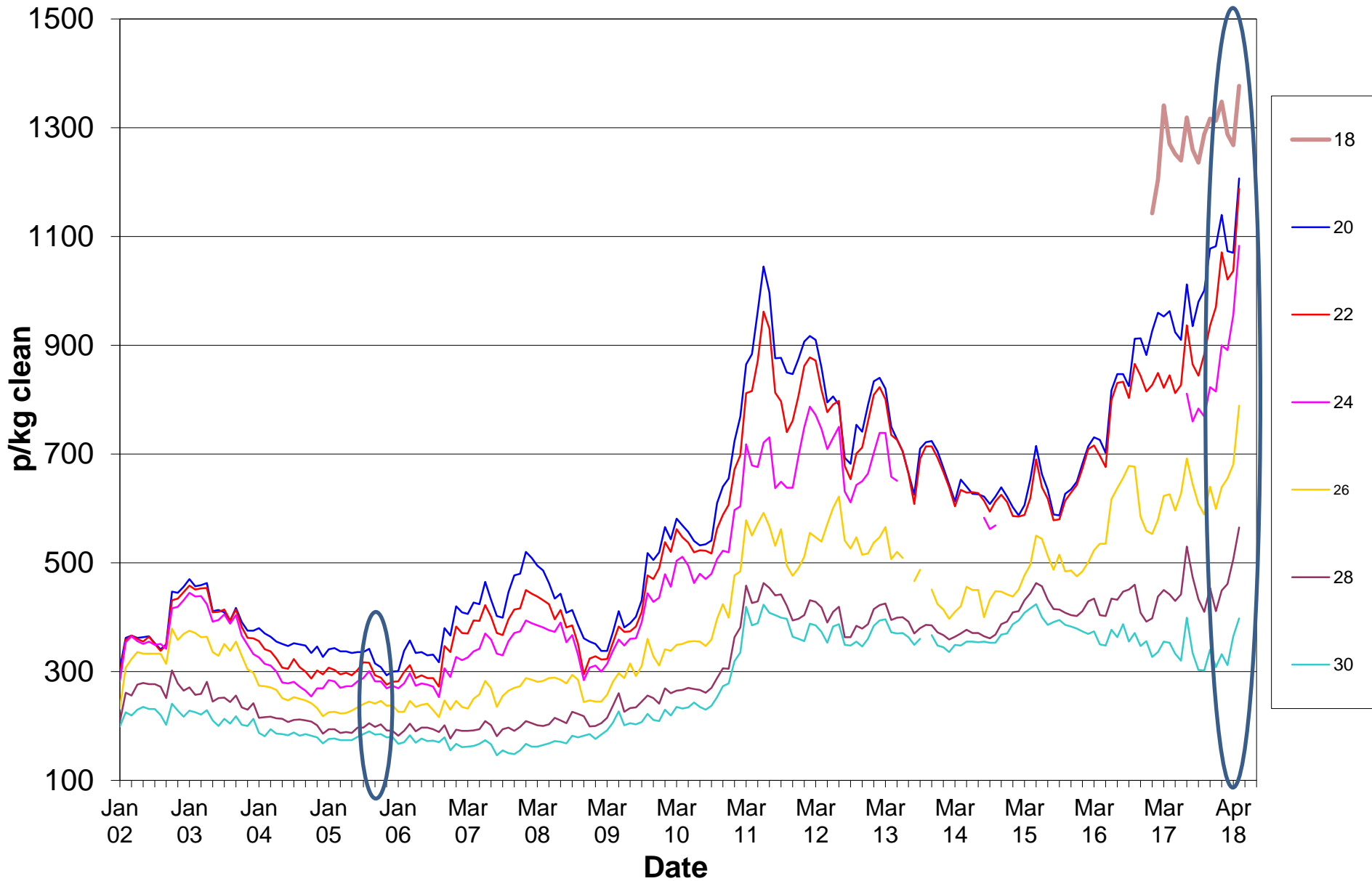
Falkland Islands Micron Profile 2017/18 (NZWTA and WTAE)



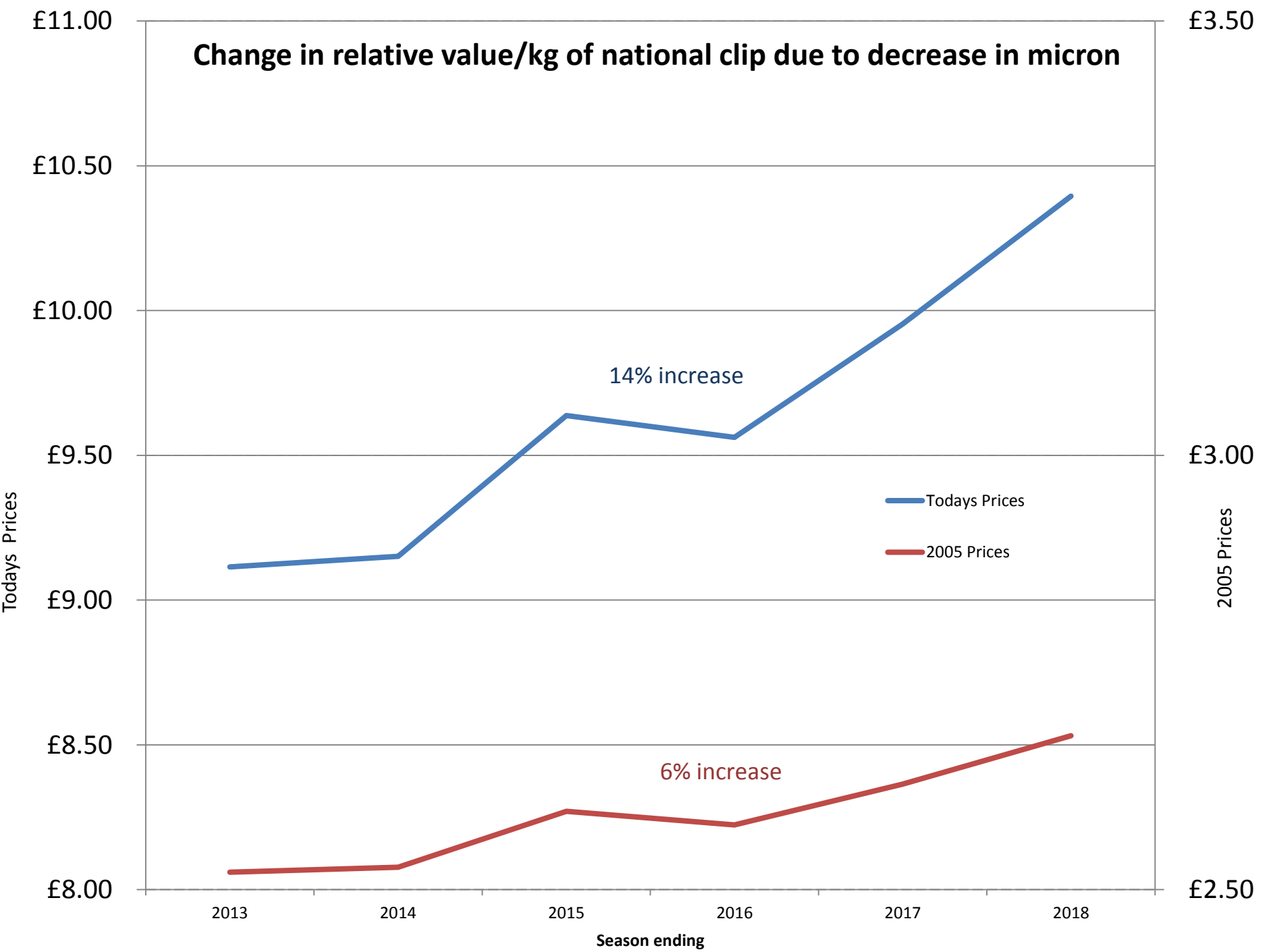
Falkland Islands Micron profile change- 2012-2018 (NZWTA airflow)



AWEX Wool Price Summary 2002 - 2018

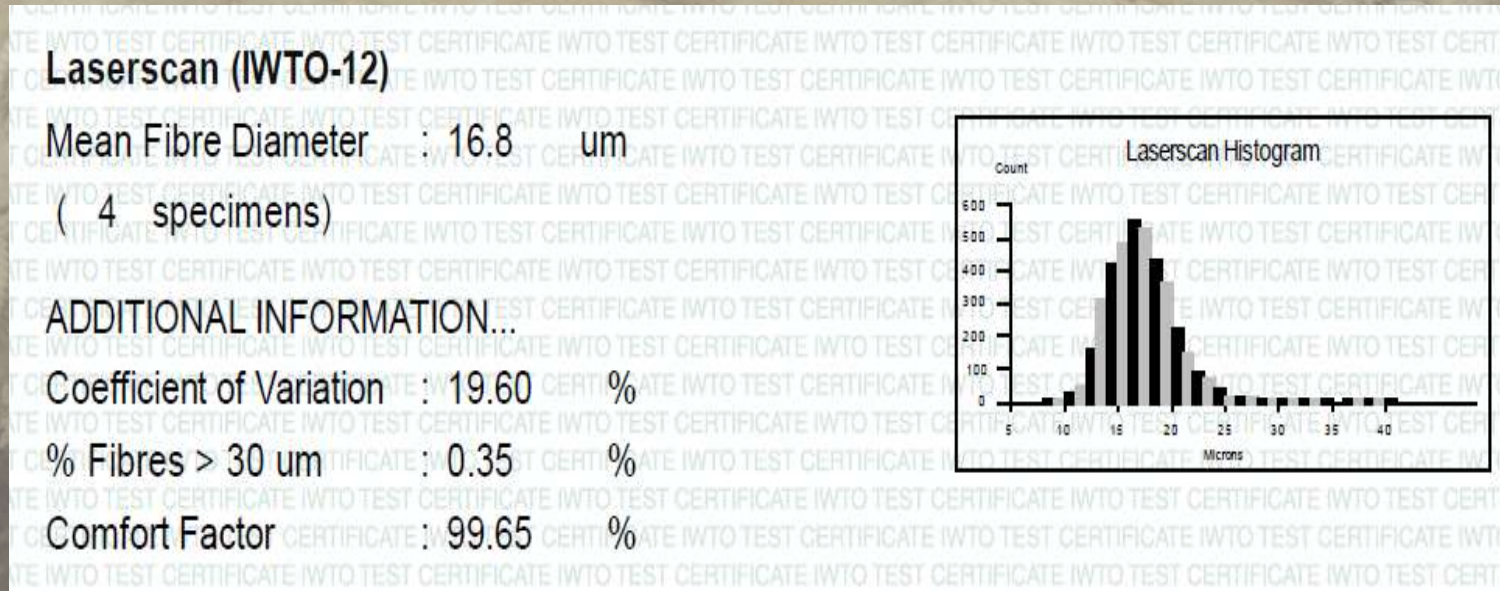


Change in relative value/kg of national clip due to decrease in micron



Laserscan

- Developed by CSIRO to accurately measure fibre diameter

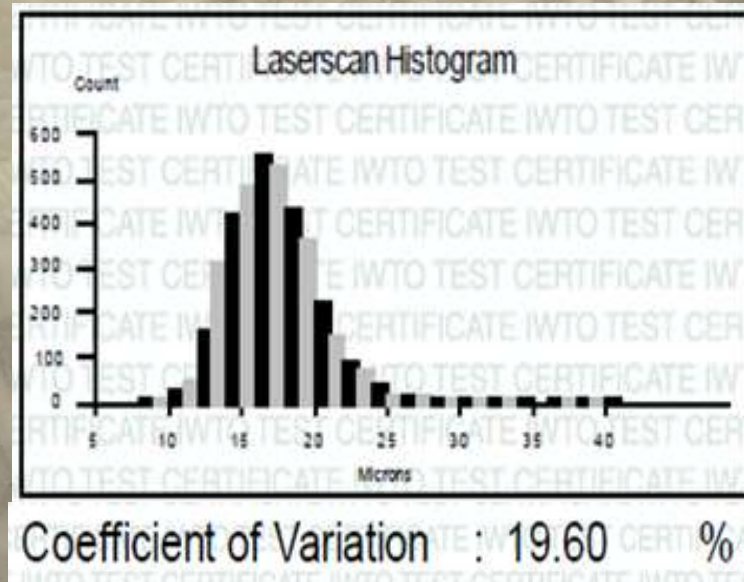
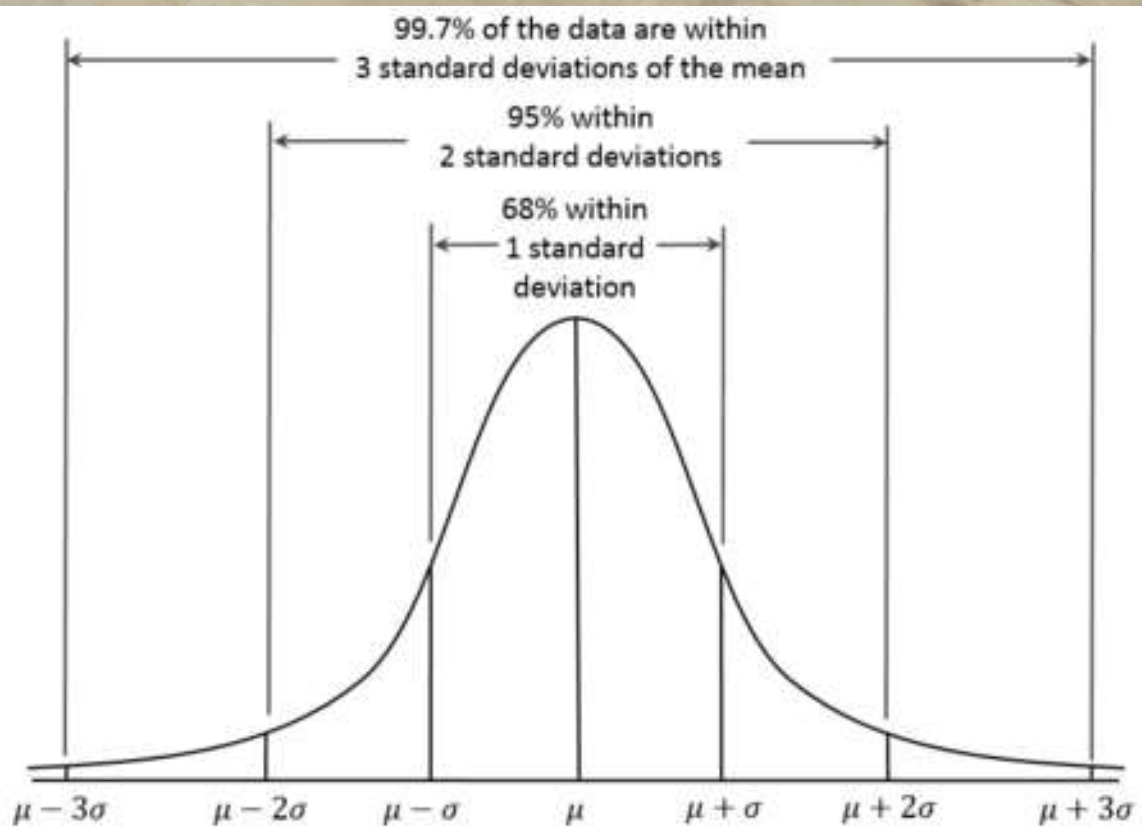


- Curvature
- 2mm snips give >2000 individual readings / sample

Laserscan- how does it work?

<https://www.youtube.com/watch?v=fC06ill2up0>

SD and CVD



Standard Deviation = Statistical measure of variability

Coefficient of Variation (CVD) = Measure of SD relative to mean

SD and CVD

MFD	SD	CoV
20 μm	4 μm	20%
20 μm	5 μm	25%
25 μm	4 μm	16%
25 μm	5 μm	20%

“The 5% rule” - Wools with a MFD of 21 μm and a CVD of 20% produce yarns with properties similar to 20 μm wool with a CVD of 25%

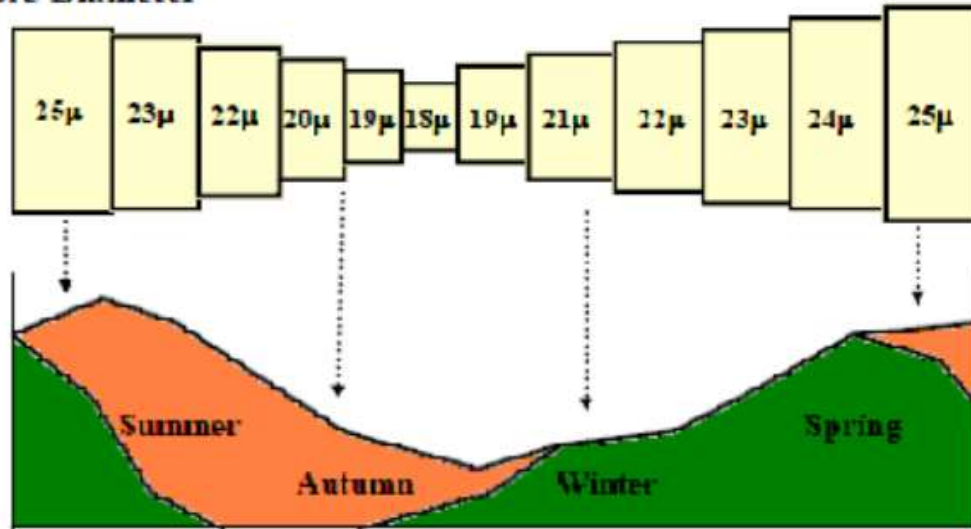
=a change of 5% in CVD is equivalent to 1 μm MFD

Australian average CVD = 20-21%

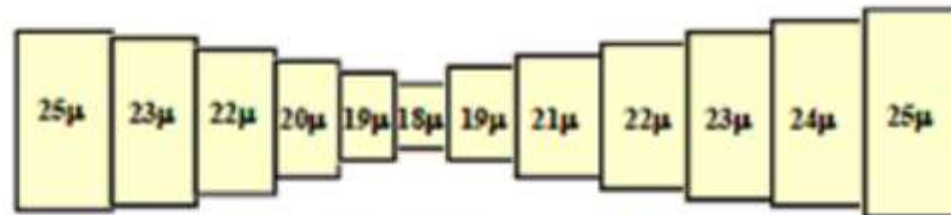
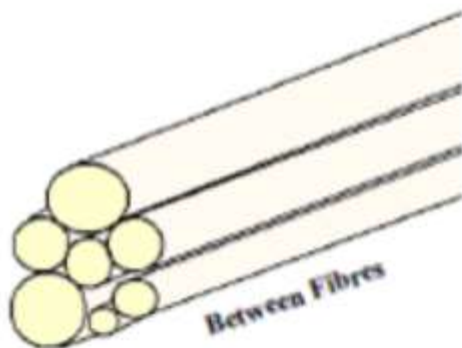
Falklands Average CVD (16/17 trial) = 24%



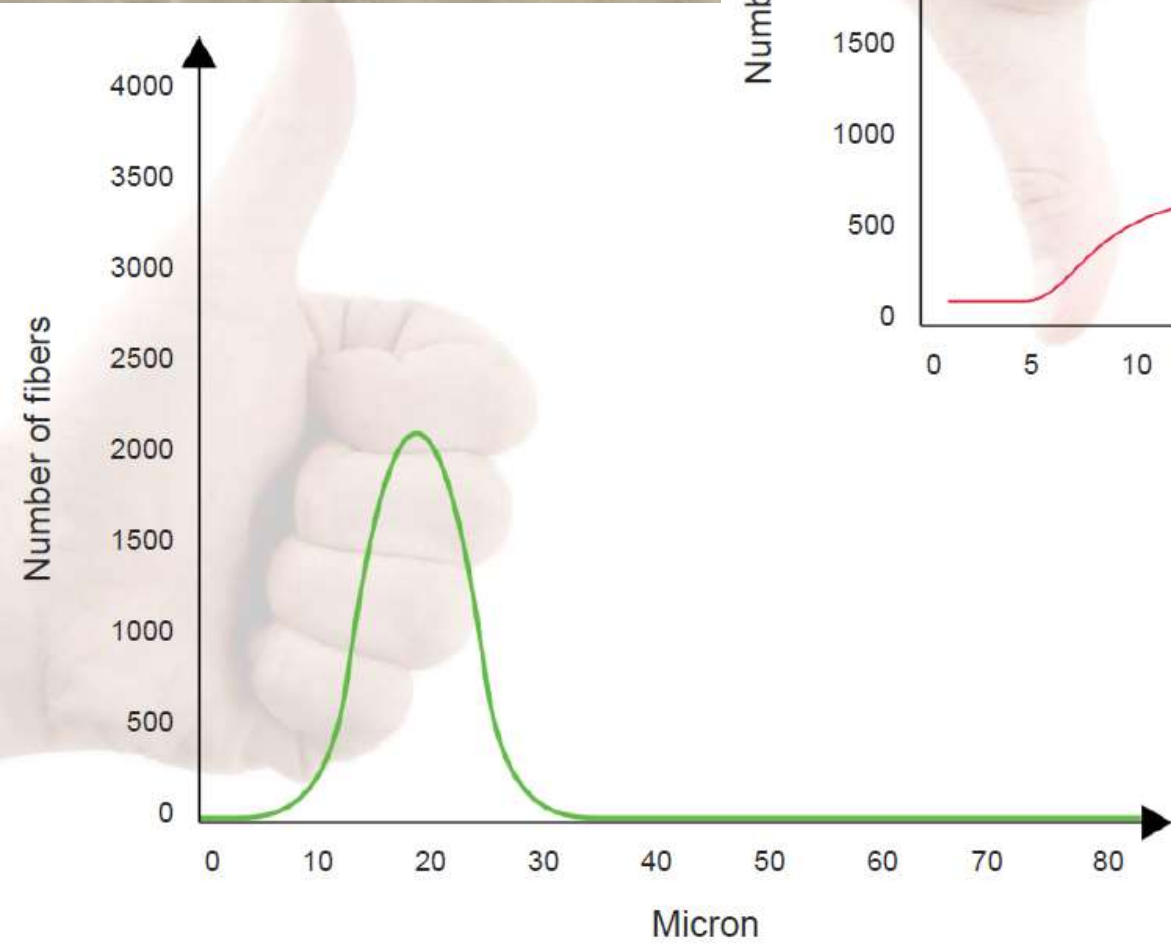
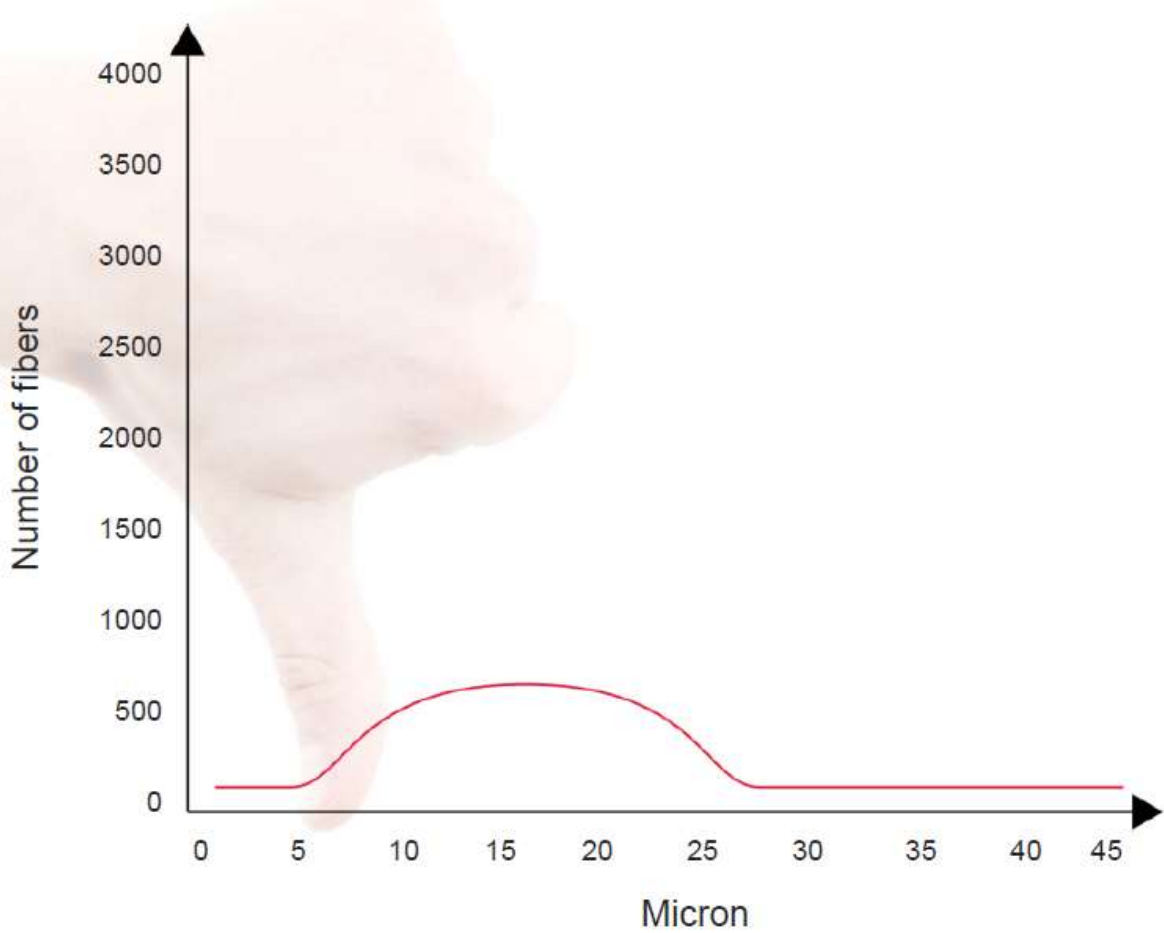
Fibre Diameter



Pasture Growth



Along the fibre



Commercial Implications

- **Benefits to the wool grower**
 - **Use the additional information (CVD, Comfort Factor) to assist marketing efforts**
- **Benefits to traders and processors**
 - **Allow wool to be purchased on the same basis as wool from Australia, SA & NZ***
 - **More confidence in predicting processing performance of Falklands wool**

Approval process

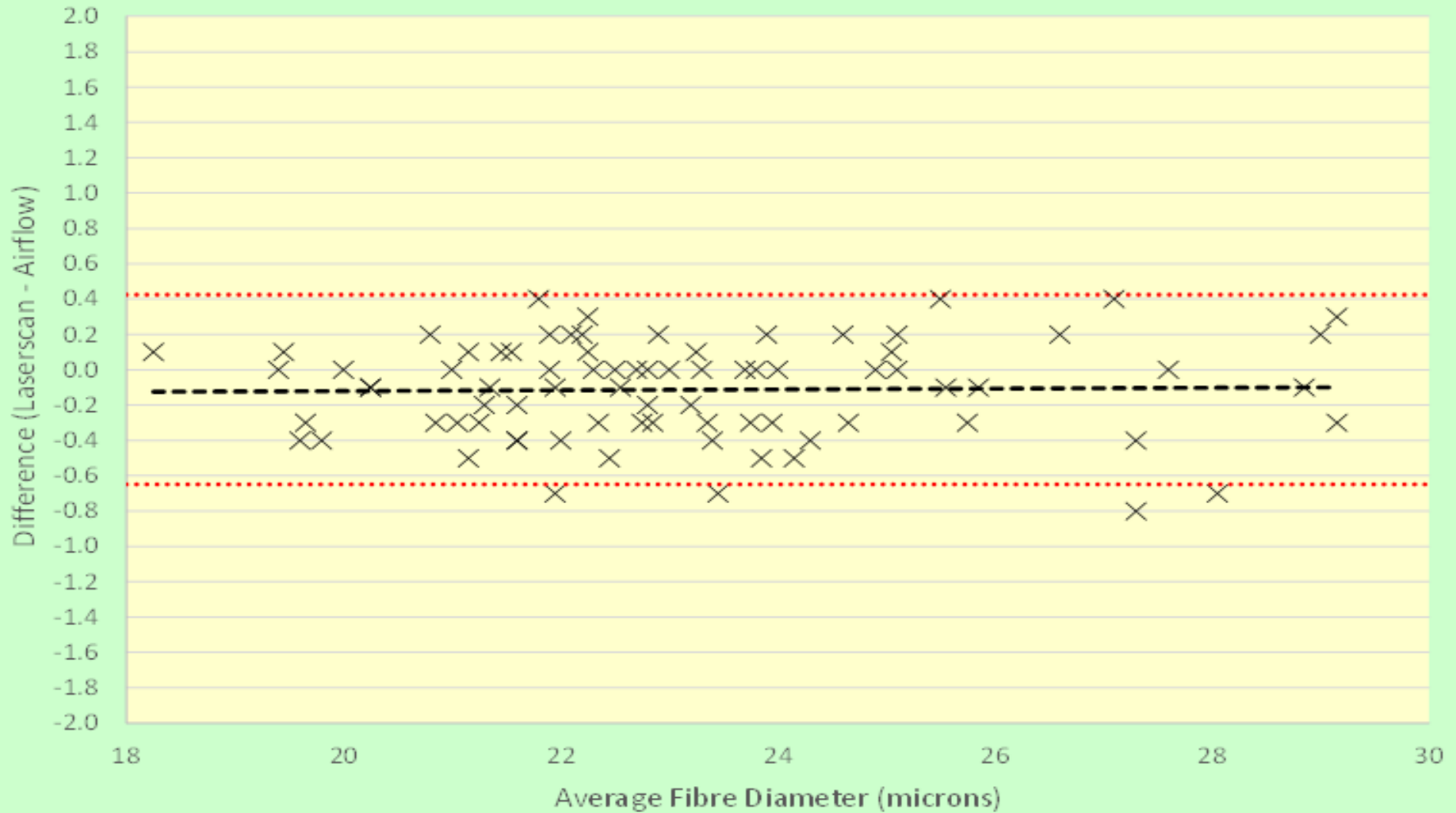
- Current IWTO rules mandate airflow as default
 - Study NZWTA and DoA
 - Present paper to IWTO (Hong Kong)
 - Accepted by IWTO Raw Materials Group
 - Passed IWTO general assembly
 - **Note 2:** ~~Australian raw wool, NZ Merino raw wool and South African raw wool~~, Raw wool from Australia, South Africa and the Falkland Islands, and New Zealand Merino raw wool, unless otherwise specified in a contract, will not require an accompanying ~~MFD~~ Mean Fibre Diameter measurement by IWTO-28 (Airflow).

Trial results

	Airflow	Laserscan	Average	Difference (LSN-AF)
Observations	80	80	80	80
Mean (μm)	23.23	23.12	23.18	-0.11
SD (μm)	2.46	2.46		0.27
Std Error (μm)	0.27	0.28		0.03
Significance				***

Trial results

Difference versus Average



Laserscan- the way forward

- Laserscan is £7.47 > Airflow
 - Approx. £0.004/kg (clean)
- Recommend:
 - 2018-19 Laserscan for all FK wools <26µm
 - 2-3 years transition of full FK clip to Laserscan

*NZWTA pricing (WTAE did not provide test pricing when requested)

Length and Strength testing

What is it?

Length/Strength (IWTO - 30)

Mean Staple Length (66 Staples) 107 mm

Coefficient of Variation Staple Length 13 %

Mean Staple Strength (60 Staples) 38 N/Kt

Distribution of position of break

Tip: 0% Middle: 40% Base: 60%

How is testing performed?

- <https://www.youtube.com/watch?v=XOCsB22zYU8>

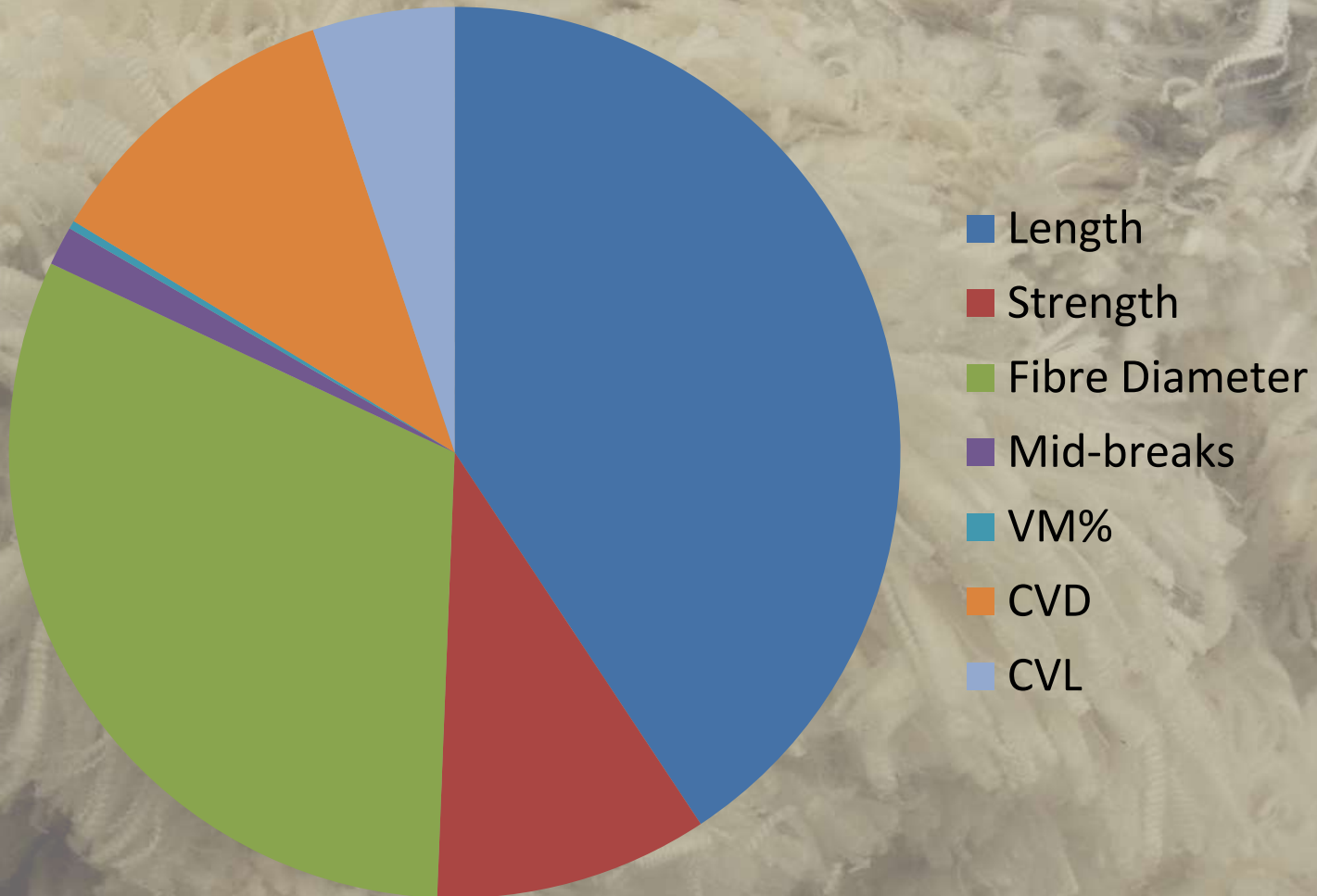
Why is it important

- Determines 'Hauteur' (length of fibres) in a wool top / yarn
 - Second biggest contributor to price of wool tops
- Using TEAM3 formulae:

$$H = 0.43L + 0.35S + 1.38D - 0.15M - 0.45V - 0.59CVD - 0.32CVL + 21.8$$

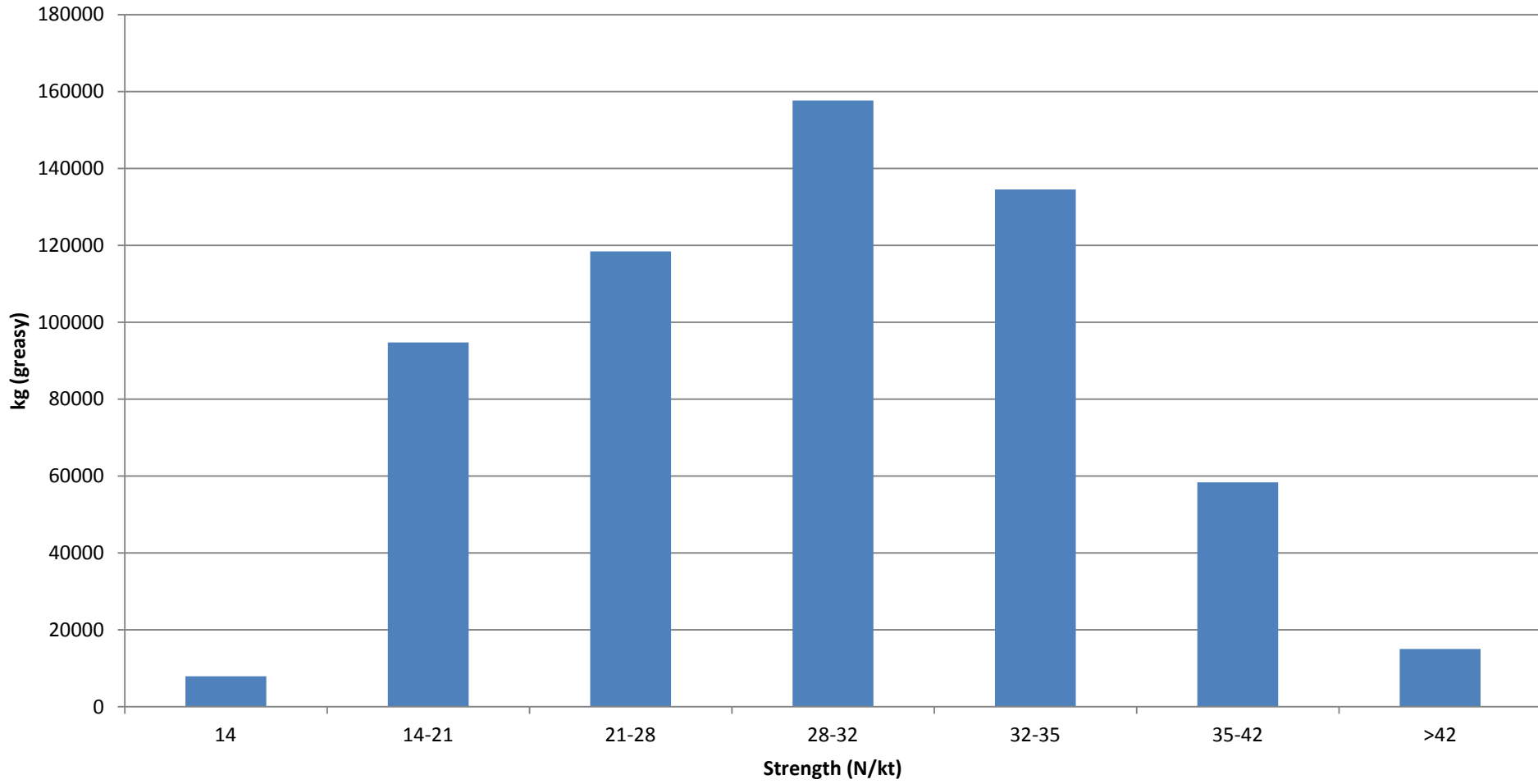
- H= Hauteur (mm)
- L = Staple Length (mm)
- S = Staple Strength (N/ktex)
- D = Mean fibre diameter (μm)
- M = Mid-breaks (%)
- V = Vegetable Matter (%)
- CVD= Coefficient of Variation Fibre Diameter
- CVL = Coefficient of Variation Staple Length

Contribution of typical FK wool traits to Hauteur

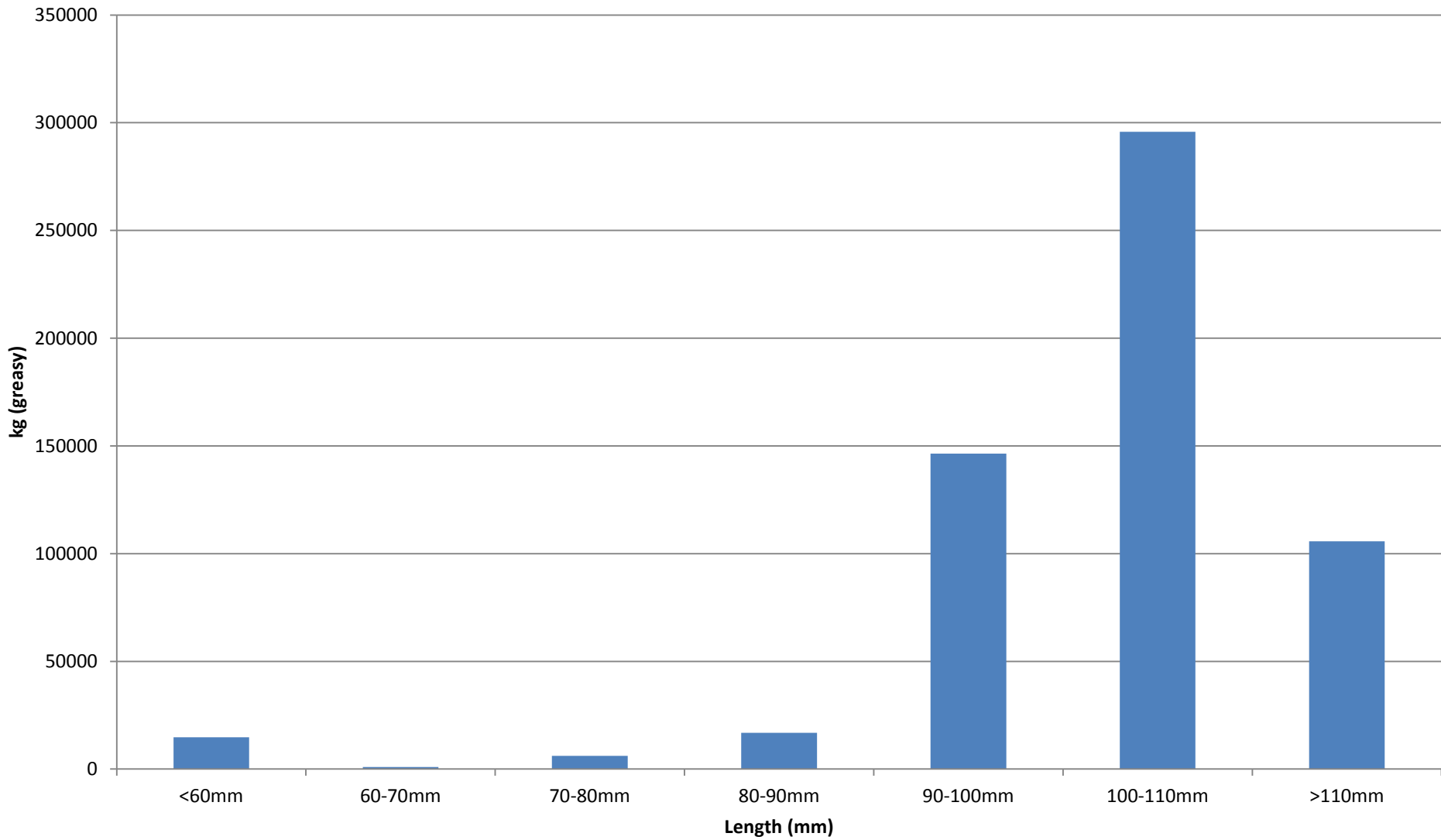


$$H = 0.43L + 0.35S + 1.38D - 0.15M - 0.45V - 0.59CVD - 0.32CVL + 21.8$$

Falkland Islands strength profile (NZWTA 2017/18)



Falkland Islands length profile (NZWTA 2017/18)



Other results

- Coefficient of Variation in Length

CVL	Uniformity	% lots tested
<12%	Excellent	2.4%
13-17%	Good uniformity	58.9%
18-22%	Decreasing	31.1%
>22%	Poor	7.7%

- Mid-breaks

MB%	% lots tested
<40	87%
40-60	10%
>60	3%

	Strength (Nkt)			W1	W2	W3	
	Mic.	42	35	28	21	14	
MF4E 90mm 1.0%v/m	20.5	2340	2335	2330	2325	2285	2275
	.6	+5	2333	-5	-10	-50	-60
	.7		2331				
	.8		2329				
	.9		2327				
	21.0	2330	2325	2320	2315	2280	2270
	.1	+5	2323	-5	-10	-45	-55
	.2		2321				
	.3		2319				
	.4		2317				
	.5	2320	2315	2310	2305	2270	2260
	.6	+5	2314	-5	-10	-45	-55
	.7		2313				
.8		2312					
.9		2311					
22.0	2315	2310	2305	2305	2260	2250	

Premium and Discounts		Micron		
		21.0	23.0	25.0
Length	110mm	-20	-15	0
	100mm	-10	0	0
	90mm	0	0	-7
	80mm	-5	-6	na
	70mm	-7	-8	na
	60mm	-50	-50	na
A.M.	Yes	0	0	0
	No	-35	-33	na
Mid break	<40	+5	0	0
	40-60	0	0	0
	>60	-40	-30	0

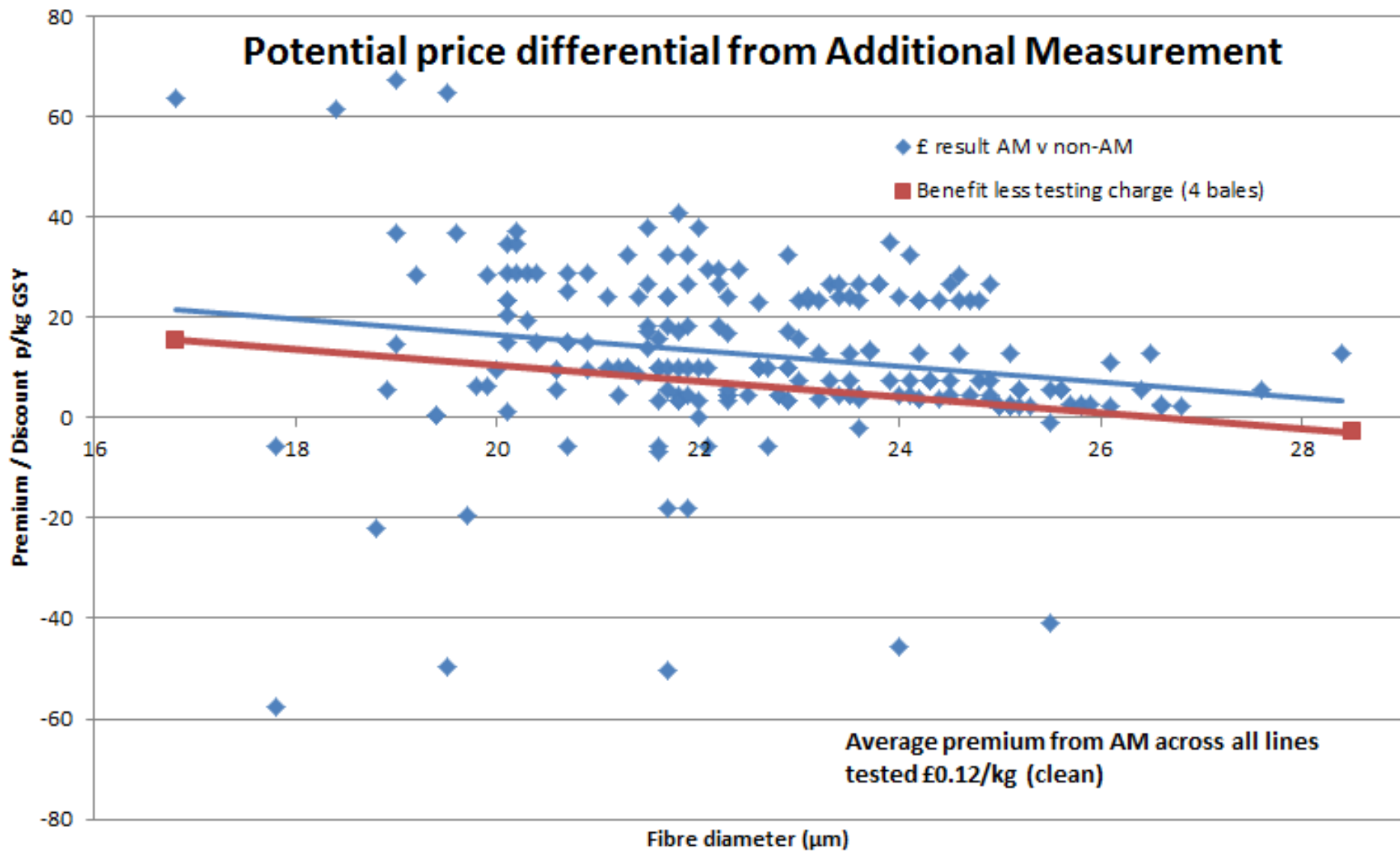
XF5E 110mm	26.0		1550 n	
	.5		1430 n	
	27.0		1345 n	
	.5		1180 n	
	28.0	1055 n	1050 n	1045
	.5	+5	950 n	-5
	29.0		875 n	
	.5		775 n	
	30.0	703 n	700 n	695
	.5	+3	640 n	-5
	31.0		570 n	
	.5		490 n	
32.0		435 n		

Source: AWEX Premium and Discount report (North) 21 June 2018. Sale S51

What does it cost / is it worth it?

DoA testing charges	£30
WoolCo, non-member grab fee	£15
Total Length and Strength charges	£45
Cost/kg based on 4 x 180kg bales	£0.06/kg (GSY)
Cost/kg based on 12 x 180kg bales	£0.02/kg (GSY)

Potential price differential from Additional Measurement



Recommendations on testing (18/19)

- Additional measurement
 - Lines $<26\mu\text{m}$ grab sampled
 - Consider testing $<21\mu\text{m}$ PCS and BLS
- Laserscan
 - Laserscan for all FK wools $<26\mu\text{m}$
 - Default test for all lines unless Airflow is requested
 - 2-3 years transition of full FK clip to Laserscan