

In cooperation with

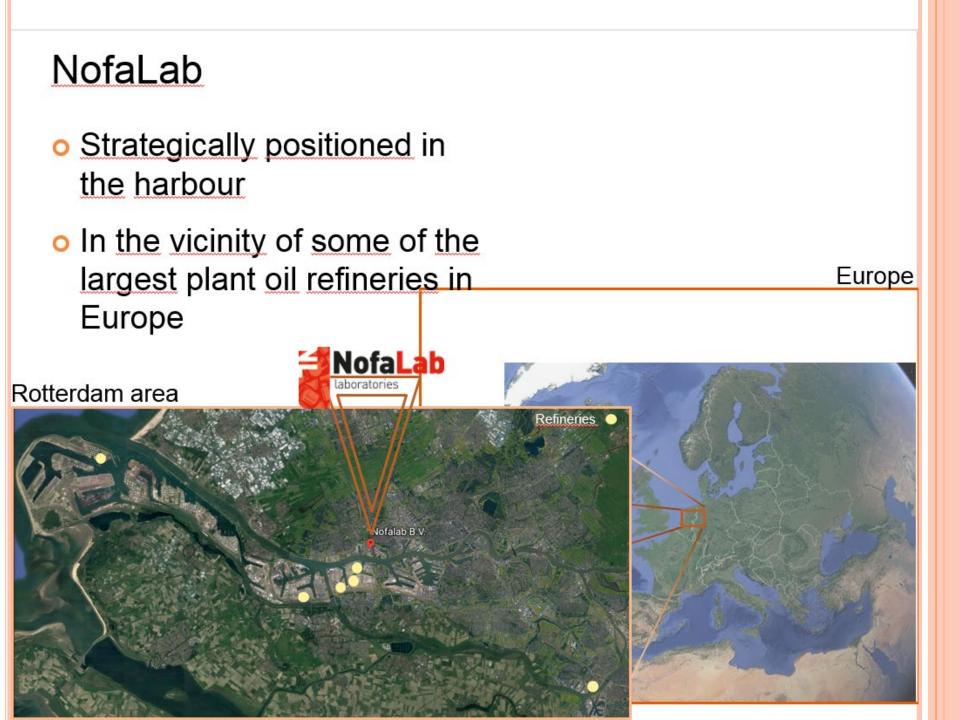
Thermo Fisher



#### **ARE YOU BEING SERVED?**

#### THE BENEFITS OF DUAL DATA ACQUISITION IN A ROUTINE DIOXIN LAB





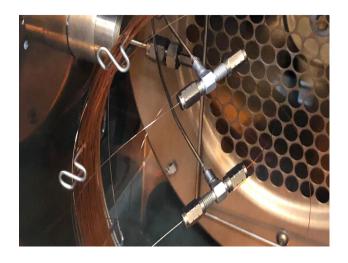


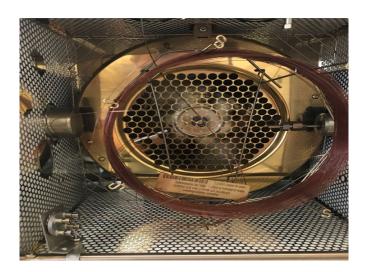




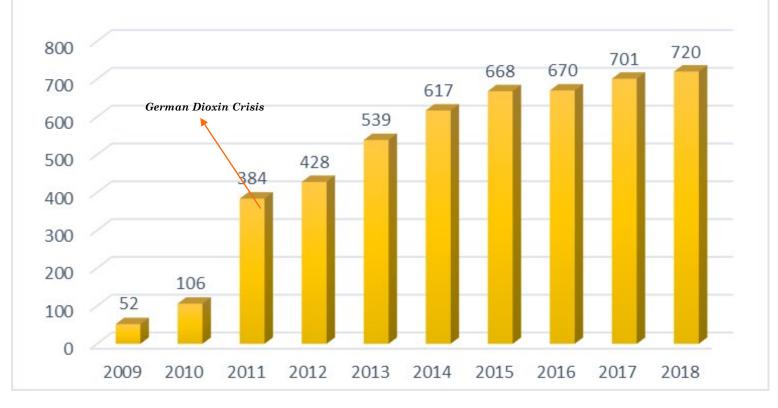
#### START OF DIOXINS AT NOFALAB

- 2008 1st DFS and 1<sup>st</sup> generation cleanup system (FMS)
- 2010 2nd DFS and two 1<sup>st</sup> generation cleanup system
- 2013 both DFS systems eqquiped with Dual Data Acquisition (D.D.A.) (1st generation)
- 2015 3rd DFS installed with 2<sup>nd</sup> generation D.D.A. and 2 (2<sup>nd</sup> generation) Cleanup systems





#### Samples per month



Kind of samples:

- 1. Vegetable/Animal Oils, fats and Fatty Acids
- 2. Human food (eg. Milk, eggs, fish, meat, seeds)
- 3. Animal feed (eg. compound feed, trace materials)
- 4. Ect.





#### How do we do it







#### This is how we did it: From 72 hours reporting time to 24 and 8 hours

- o 2008-2013 without DDA
  - 72 hours standard reporting time
  - 10 samples a day 24 hours reporting time
- o 2013-20xx with DDA:
  - 75% of the samples within 24hours
- o 2014-20xx with DDA and GO-HT
  - 8 samples within 8 hours Dioxins and PCBs





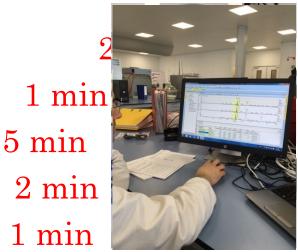
#### 8HOUR SERVICE (ONLY FOR OIL TYPE SAMPLES)

- Weight in sample (±1,5 g of fat)
- Spike with <sup>13</sup>C labeled std.
- Load sample onto the column
- Attach all columns
- Load column set to the system
- Start program
- Concentrate
- Inject in GC-HRMS (D.D.A.) 51 min\*

Total:

• Evaluating and reporting

\* After the first injection all other samples take 26 minutes.



 $5 \min$ 

73 min

40 min

180 min





# STRATEGY FOR 40 SAMPLES A DAY (POSSIBLE)?

- Preparing the first batch/run most time consuming.
- When first batch will be processed by cleanup system, the 2<sup>nd</sup> batch can already be prepared. You have 73 minutes time to finish.
- Working time 7am till 5 pm
- 10 hours / 1,52 hours = 6,58 sequences a day.
- Everyday a blanc system and recovery (1 for oil type samples and 1 for solid type samples) is done
- Staff: 3/4 men working on the extraction/clean-up 2 men do the evaluating/reporting of the data



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#### HOW TO MANAGE

- Average weekly number of samples 160
- On top at least 15 QA samples + 15 Proce
- Often 5 samples re-analysis (confirm
- 8 hrs per week 400 fractions Total number of samples j
- of 7 indards + 15 DL and NDL- PCB On top at least 15 die ack standards
- injections is 430 Total p
- onpolar column run-time for each fraction 55

case of two single GC-HRMS instruments 197,08 hrs required per instrument



#### How do we manage GC-HRMS DUAL ACQUISITION

DualData AS1 GC1 AS2 GC2						
Run Parameter						
Method Type dual (alternating)	Start Device 1	- į				
	Valves Mode with Valves					
	Injection by Autosampler					
Event Settings						
GC 1 C:\Xcalibur\data\2019\\/eek16\CS1_190416.raw No.   Event Time						
100	-4 0 4 8 12 16 20 24 28 32 36 40 44 48 52 56	1 Start DFS 23				
100 Inject 80 PrepRun AS 60 20 20 20 20 20 20 20 20 20 20 20 20 20	Start DFS	2 Stop DFS 51				
-4 0 4 8	12 16 20 24 28 32 36 40 44 48 52 56 60 64 68 72 76 80 84					
>> Display GC2 foremost	AcquisitionTime MID1 28.00 min	Runtime GC1 51.00 min				
	GC 2 C:\Xcalibur\data\2019\\Week16\CS3_V_190417.raw	No.   Event   Time				
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	-4 0 4 8 12 16 20 24 28 32 36 40 44 48 52 56	1     Start DFS     23       2     Stop DFS     51				

Dual acquisition = 1,8x improvement of efficiency Every 60 minutes 2 samples are measured

#### TYPICAL SEQUENCE NOFALAB BV

#### 🎗 Week26\_diox[Open] - Sequence Setup - Home Page

👬 🎹 😽				🖾 🔶 🖪 🖬 🧕 👘 🖶		
			File Name	Path	Inst Meth	Positi
tatus Acquisiti	ion Queue	1	CS1_190624_GC1	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	1
		2	CS1_190624_GC2	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	1
	HOMEPAGE] - C: Xcalibur	3	CS2_190624_GC1	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	2
<b>8</b> 1		4	CS2_190624_GC2	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	2
- Š (	Sequence Row #76	5	CS2_190624_GC1	C:\Xcalibur\Data\2019\Week26	C:\Calibur\methods\DD_Dioxins_Furans	2
- Š İ	Sequence Row #77	6	CS3_190624_GC2	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	3
- ® [	Sequence Row #78	7	CS3_190624_GC1	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	3
- ® [	Sequence Row #79	8	CS4_190624_GC2	C:\Xcalibur\Data\2019\Week26	C:\Calibur\methods\DD_Dioxins_Furans	4
- <b>Ø</b>	Sequence Row #80	9	CS4_190624_GC1	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	4
- X I	Sequence Row #81	10	CS5_190624_GC2	C:\Xcalibur\Data\2019\Week26	C:\Calibur\methods\DD_Dioxins_Furans	5
	Sequence Row #82	11	Blanco01	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	6
<u> </u>	Sequence Row #83	12	Blanco02	C:\Xcalibur\Data\2019\Week26	C:\Calibur\methods\DD_Dioxins_Furans	7
<u> </u>	Sequence Row #84	13	blanco03	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	6
S.	Sequence Row #85	14	Blanco04	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	7
S.	Sequence Row #86	15	blanco05	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	6
S.	Sequence Row #87 Sequence Row #88	16	blanco06	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	7
×.	Sequence Row #89	17	2019030630_d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	115
a a constant	Sequence Row #90	18	2019030631 d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	116
. A	Sequence Row #91	19	2019030691 d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	117
	Sequence Row #92	20	2019029974 d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	118
- Š	Sequence Row #93	21	2019030460 d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	119
- Š	Sequence Row #94	22	2019030632_d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	120
- ŠĬ	Sequence Row #95	23	2019030633_d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	121
- Š İ	Sequence Row #96	24	2019029983 d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	122
- ® (	Sequence Row #97	25	2019030591 d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	123
- ® [	Sequence Row #98	26	2019030696 d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	124
- ® [	Sequence Row #99	27	2019030693 d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	125
- 🕸 🛛	Sequence Row #100	28	2019030695 d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	126
	Sequence Row #101	29	2019030692_d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	127
<u> </u>	Sequence Row #102	30	2019030694 d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	128
_ <mark>∞</mark>	Sequence Row #103	31	2019030590 d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	129
<u> </u>	Sequence Row #104	32	2019030564 d	C:\Xcalibur\Data\2019\Week26	C: \Calibur\methods\DD_Dioxins_Furans	130
- X	Sequence Row #105	33	2019030594 d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	131
S.	Sequence Row #106 Sequence Row #107	34	CS1_V_190625_GC2	C:\Xcalibur\Data\2019\Week26	C: \Calibur\methods\DD_Dioxins_Furans	1

		File Name	Path	Inst Meth	Position
Status Acquisition Queue	34	CS1_V_190625_GC2	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	1
E All Sequences	35	CS1_V_190625_GC1	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	1
E [HOMEPAGE] - C:\Xcalibu	36	RecSer_190624	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	137
🛛 🐼 🚺 Sequence Row #75	37	Rec190624	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	140
- 🐼 🚺 Sequence Row #76	38	BlancoSys_SER_190624	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	138
- 🔊 🗍 Sequence Row #77	39	BlancoSys_190624	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	139
- 🐼 🚺 Sequence Row #78	40	2019030589_d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	132
🛛 🕸 🚺 Sequence Row #79	41	2019030254_d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	139
🛛 🕸 📘 Sequence Row #80	42	2019030608_d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	139
Sequence Row #81	43	2019030595_d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	139
Sequence Row #82	44	2019030893_d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	141
Sequence Row #83	45	2019030372_d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	142
Sequence Row #84	46	2019030364_d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	143
Sequence Row #85	47	2019030757_d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	144
Sequence Row #86	48	2019030572_d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	136
Sequence Row #88	49	2019030848_d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	145
Sequence Row #89	50	2019030662_d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	146
Sequence Row #90	51	2019030661_d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	147
Sequence Row #91	52	2019031127_d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	148
Sequence Row #92	53	2019030981_d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	149
🛛 🐼 👖 Sequence Row #93	54	2019030955_d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	150
🛛 🐼 👖 Sequence Row #94	55	CS2_V_190625_GC1	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	2
- 🔊 🗍 Sequence Row #95	56	CS2_V_190625_GC2	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	2
- 🐼 🚺 Sequence Row #96	57	Blanco07	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	7
Sequence Row #97	58	Blanco08	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	7
🛛 🕸 📙 Sequence Row #98	59	2019030933_d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	8
Image: Sequence Row #78         Image: Sequence Row #80         Image: Sequence Row #80         Image: Sequence Row #81         Image: Sequence Row #81         Image: Sequence Row #82         Image: Sequence Row #83         Image: Sequence Row #83         Image: Sequence Row #83         Image: Sequence Row #83         Image: Sequence Row #84         Image: Sequence Row #85         Image: Sequence Row #85         Image: Sequence Row #85         Image: Sequence Row #86         Image: Sequence Row #87         Image: Sequence Row #88         Image: Sequence Row #87         Image: Sequence Row #89         Image: Sequence Row #89         Image: Sequence Row #89         Image: Sequence Row #91         Image: Sequence Row #92         Image: Sequence Row #93         Image: Sequence Row #93         Image: Sequence Row #93         Image: Sequence Row #94         Image: Sequence Row #95         Image: Sequence Row #96         Image: Sequence Row #97         Image: Sequence Row #98         Image: Sequence Row #98         Image: Sequence Row #98         Image: Sequence Row #98 <tdimage: #98<="" row="" sequence="" td="">      &lt;</tdimage:>	60	2019030742_d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	9
Sequence Row #100	61	2019030745_d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	10
Sequence Row #101	62	2019030965_d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	11
Sequence Row #102	63	2019030749_d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	12
Sequence Row #103	64	2019028426_d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	13
⊗ ↓ Sequence Row #101 ⊗ ↓ Sequence Row #102 ⊗ ↓ Sequence Row #103 ⊗ ↓ Sequence Row #104 ⊗ ↓ Sequence Row #105	65	2019030565_d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	14
Sequence Row #105	66	2019030759_d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	15
Sequence Row #100	67	2019031069_d	C:\Xcalibur\Data\2019\Week26	C:\Xcalibur\methods\DD_Dioxins_Furans	16
	0.0	· · · · · · · · · · · · · · · · · · ·			· -

# ADDITIONAL BENEFITS OF THE DUAL DATA OPTION

- Source will stay cleaner for a longer time (no solvent and early eluting analytes do enter the source anymore).
- With the DualData XL option the sample throughput of a DFS can be almost doubled"
- Fast column change (no need to break the vacuum in the source).



#### DISADVANTAGES OF THE DUAL DATA OPTION

- Once a sequence is started in Dual Data, no changes in sequence order can be made
- No back-up system
  - When you have downtime, you don't have a second system



#### FOR THE COMING FUTURE?

## • The possibility to include a sample and/or update the sequence queue?!

		1-1 🛐 🏈 🚉 🗓			
	$\square$	File Name	Path	Inst Meth	Position
Status Acquisition Queue	1	CS1_190715_GC1	C:\Xcalibur\Data\2019\Week29	C:\Xcalibur\methods\DD_Dioxins_Furans	1
- All Sequences	2	CS1_190715_GC2	C:\Xcalibur\Data\2019\Week29	C:\Xcalibur\methods\DD_Dioxins_Furans	1
	3	CS1_V_190715	C:Wcalibur\Data\2019\Week29	C:\Calibur\methods\DD_Dioxins_Furans	150
Sequence Row #12	4	CS2_190715	C:\Xcalibur\Data\2019\Week29	C:\Xcalibur\methods\DD_Dioxins_Furans	2
- 🖸 🚺 Sequence Row #13	5	CS3_190715	C:\Xcalibur\Data\2019\Week29	C:\Xcalibur\methods\DD_Dioxins_Furans	3
🗌 👖 Sequence Row #14	6	CS4_190715	C:Wcalibur\Data\2019\Week29	C:\Calibur\methods\DD_Dioxins_Furans	4
🗋 🚺 Sequence Row #15	7	CS5_190715	C:\Xcalibur\Data\2019\Week29	C:\Xcalibur\methods\DD_Dioxins_Furans	5
- 🗆 👖 Sequence Row #16	8	Blanco01	C:\Xcalibur\Data\2019\Week29	C:\Xcalibur\methods\DD_Dioxins_Furans	6
- 🗌 📗 Sequence Row #17	9	Blanco02	C:\Xcalibur\Data\2019\Week29	C:\Calibur\methods\DD_Dioxins_Furans	7
🔲 🚽 Sequence Row #18	10	blanco03	C:\Xcalibur\Data\2019\Week29	C:\Xcalibur\methods\DD_Dioxins_Furans	6
□ U Sequence Row #19	11	Blanco04	C:\Xcalibur\Data\2019\Week29	C:\Xcalibur\methods\DD_Dioxins_Furans	7
□ U Sequence Row #20	12	2019034928_d	C:\Xcalibur\Data\2019\Week28	C:\Xcalibur\methods\DD_Dioxins_Furans	69
	13	2019034872_d	C:\Xcalibur\Data\2019\Week28	C:\Xcalibur\methods\DD_Dioxins_Furans	73
Sequence Row #22	14	2019035054_d	C:\Xcalibur\Data\2019\Week28	C:\Xcalibur\methods\DD_Dioxins_Furans	75
Sequence Row #23     Sequence Row #24	15	2019035060_d	C:\Xcalibur\Data\2019\Week28	C:\Xcalibur\methods\DD_Dioxins_Furans	76
	16	2019034953_d	C:\Xcalibur\Data\2019\Week28	C:\Xcalibur\methods\DD_Dioxins_Furans	77
Sequence Row #25	17	2019034955_d	C:\Xcalibur\Data\2019\Week28	C:\Xcalibur\methods\DD_Dioxins_Furans	78
Sequence Row #26	18	2019034962_d	C:\Xcalibur\Data\2019\Week28	C:\Xcalibur\methods\DD_Dioxins_Furans	79
Sequence Row #28	19	2019035061_d	C:\Xcalibur\Data\2019\Week28	C:\Xcalibur\methods\DD_Dioxins_Furans	80
Sequence Row #29	20	2019034963_d	C:\Xcalibur\Data\2019\Week28	C:\Xcalibur\methods\DD_Dioxins_Furans	81
- Sequence Row #30	21	2019035165_d	C:\Xcalibur\Data\2019\Week28	C:\Xcalibur\methods\DD_Dioxins_Furans	82
	22				

#### URGENT Sample

**UPDATE** 



### CONCLUSION

• To increase the throughput in your Laboratory and you don't have deep pockets;

### DualData XL is the Solution

• Less downtime, because source will stay cleaner for a longer time.

In cooperation with





