

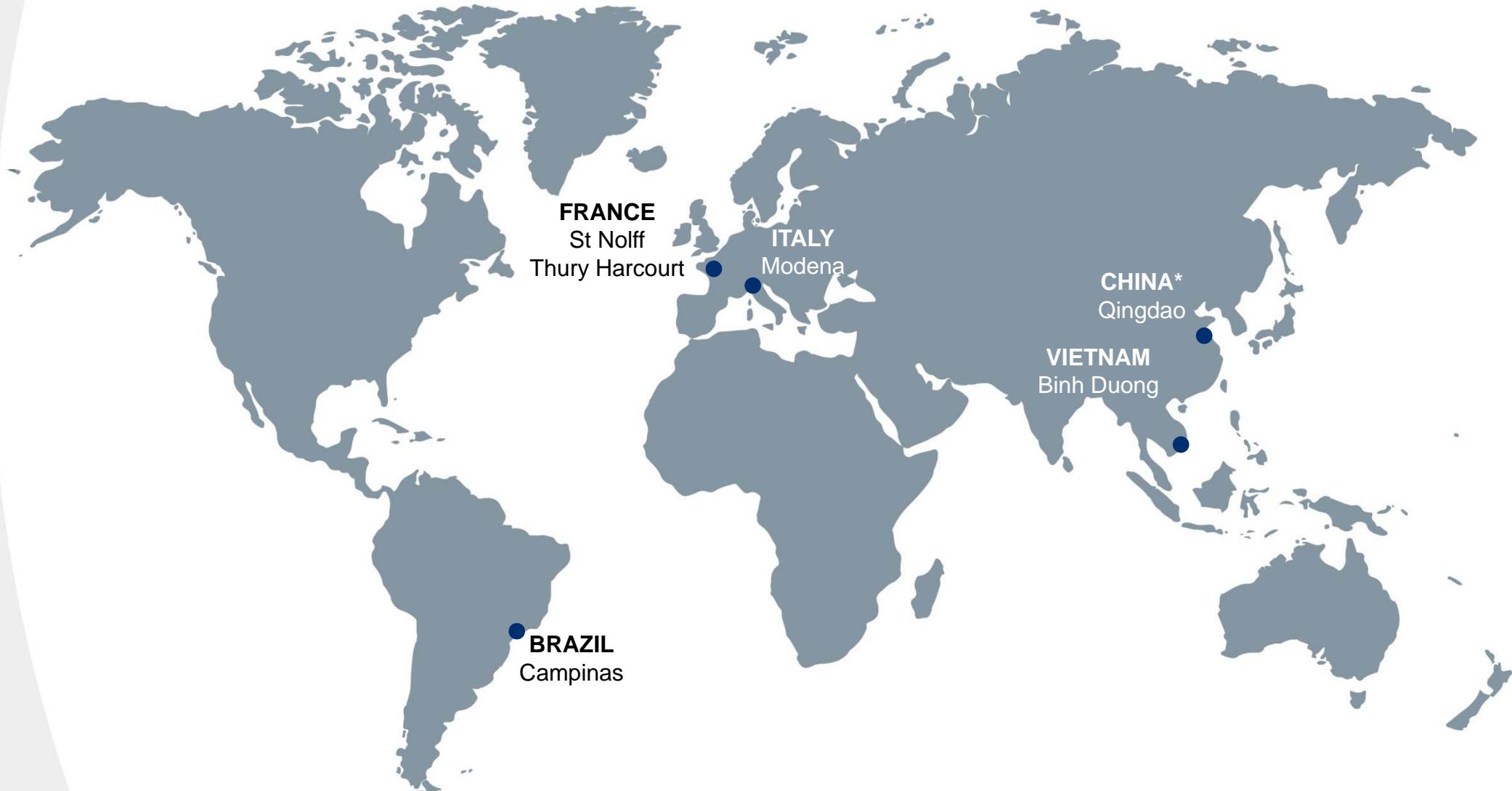


NIR : maintenance de réseaux et transfert inter-instruments

HELIOSPIR 15/10/2019

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UPSCIENCE'S NETWORK



* Providing consulting services only

NEOVIA'S NETWORK – ADM group

WORLDWIDE PRESENCE



8,950 employees



26 countries of operation



70 production sites

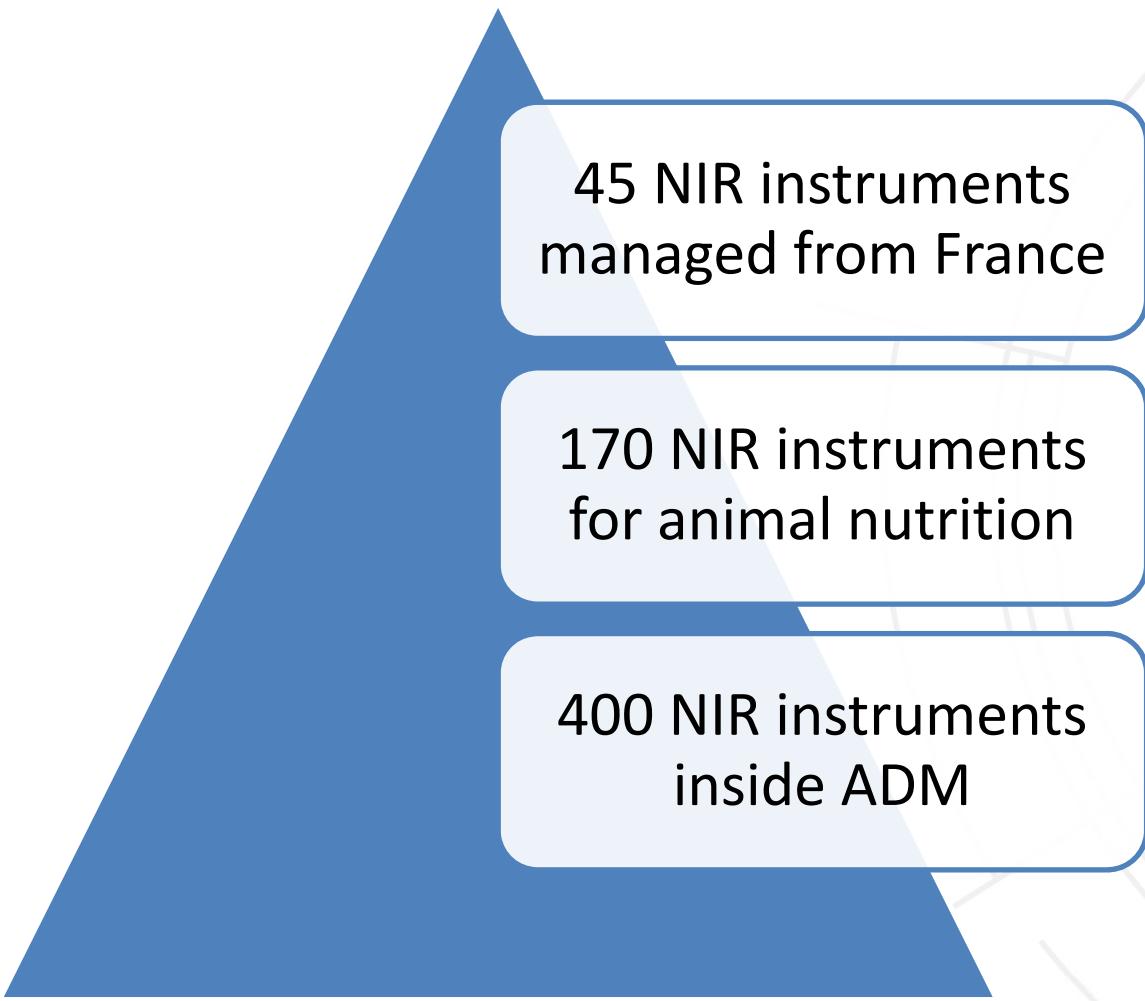


11 applied research
centres



- | | | | | | |
|------------|-----------|-------------|---------------|------------------|----------------|
| • Belgium | • China | • India | • Nigeria | • Portugal | • South Africa |
| • Brazil | • Ecuador | • Indonesia | • Netherlands | • Czech Republic | • Spain |
| • Cambodia | • France | • Italia | • Philippines | • Singapore | • Switzerland |
| • Canada | • Hungary | • Mexico | • Poland | | • Thailand |
| | | | | | • USA |
| | | | | | • Vietnam |

NIR NETWORK – ADM group



45 NIR instruments
managed from France

170 NIR instruments
for animal nutrition

400 NIR instruments
inside ADM

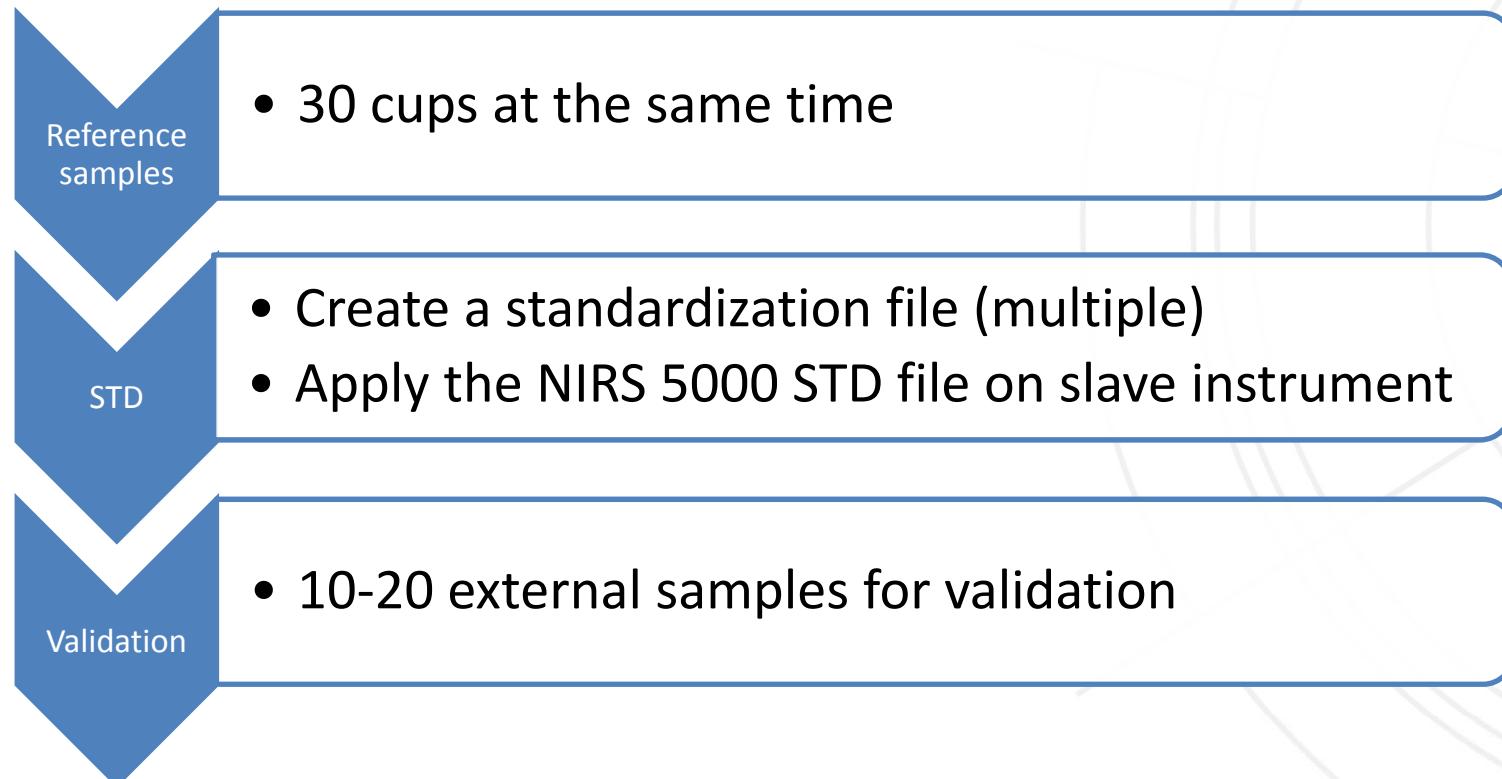
Calibration transfer

- Problematic :
 - Keep historic database
 - Manage calibrations on multi instruments
 - Manage calibrations on multi sites
 - Semi-centralized organization over the world for local needs



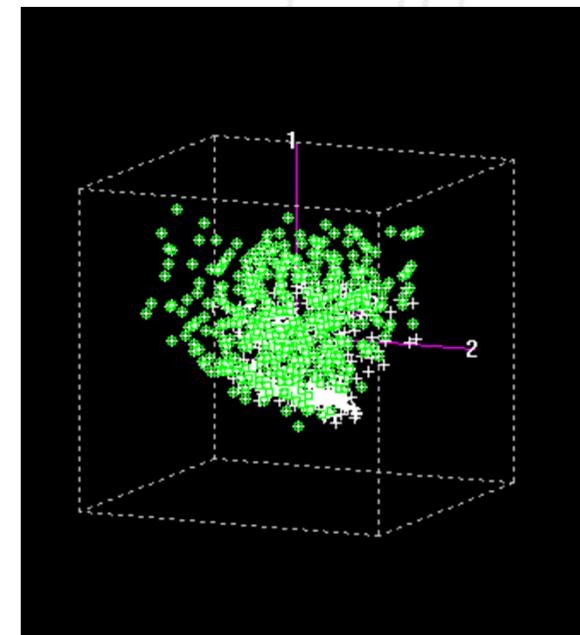
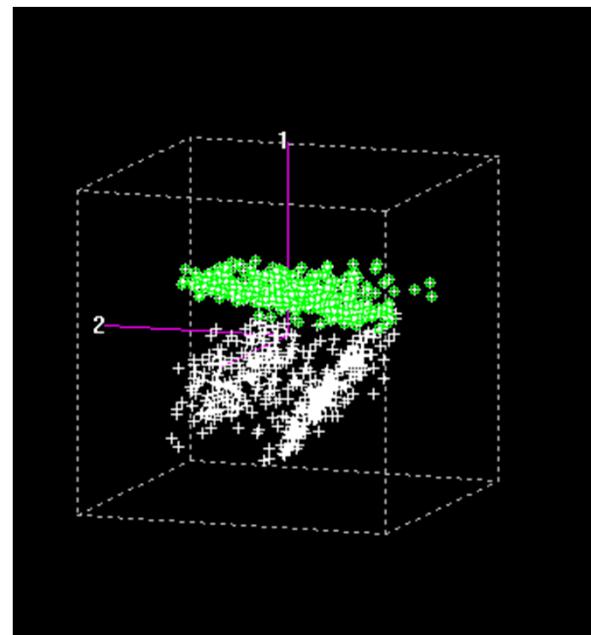
Calibration transfer : multi-instruments

- Target = reduce the variability inter-instruments
- Example : FOSS NIRS 5000 master to FOSS NIRS 5000 slave



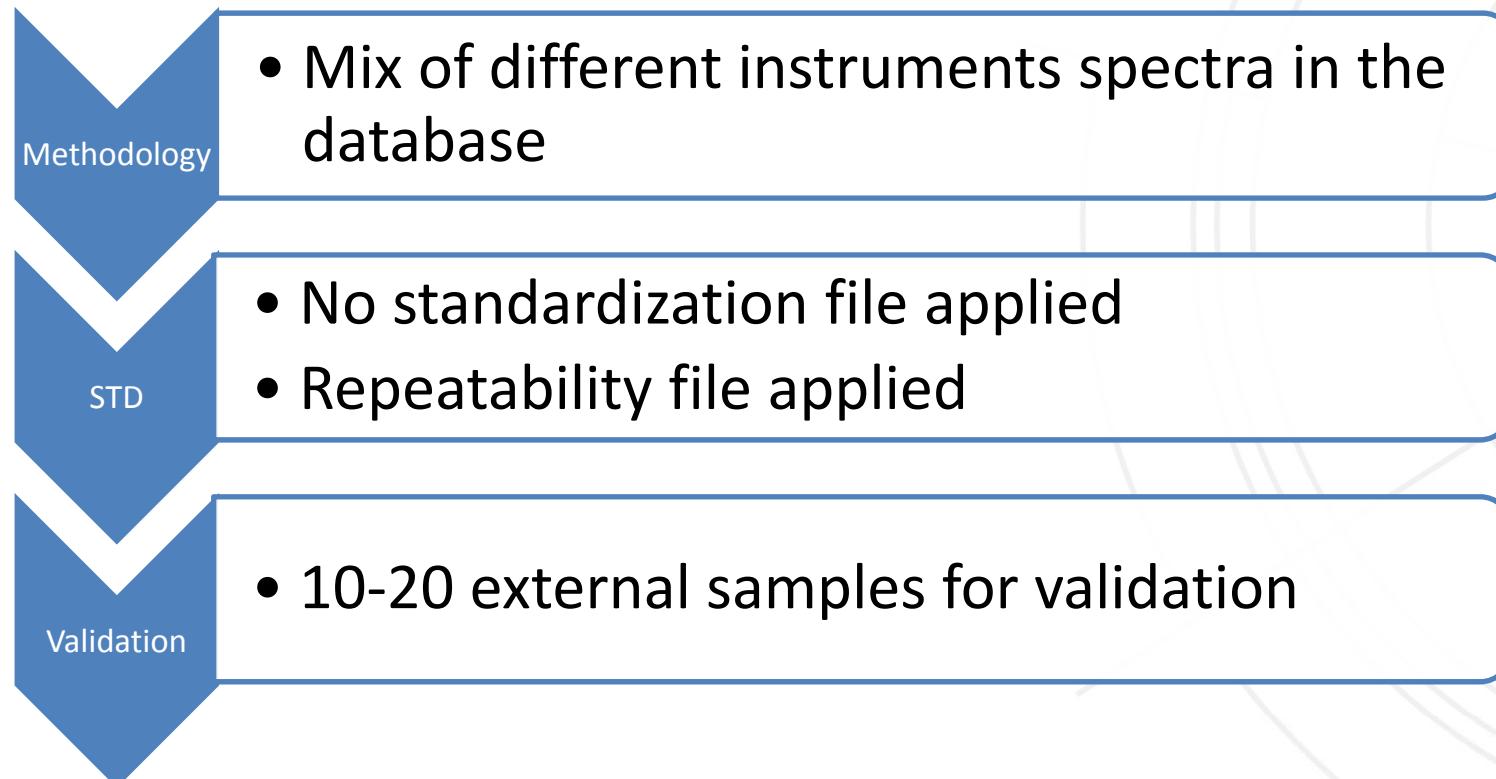
Calibration transfer : multi-instruments

- Target = keep the database performances and variability
- Example : FOSS NIRS 5000 to FOSS NIRS 5000
- With kit 30 cups



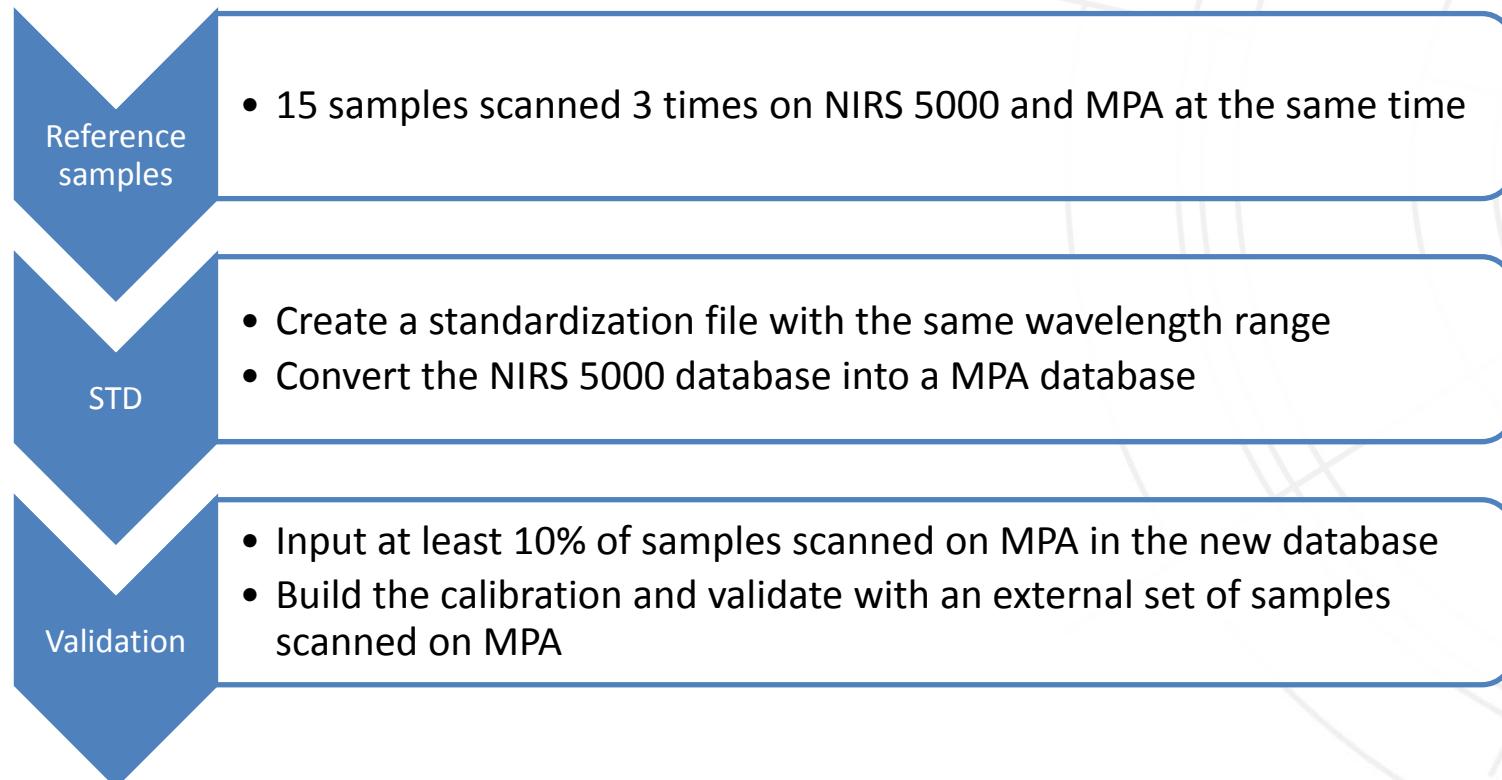
Calibration transfer : multi-instruments

- Target = reduce the variability inter-instruments
- Example : FOSS InfraXact



Calibration transfer : multi-brands

- Target = keep the database variability and model performances
- Example : FOSS NIRS 5000 to BRUKER MPA
- Simple standardization (product)



Calibration transfer : multi-instruments

- Simple STD or multiple STD from FOSS NIRS 5000 to FOSS DS2500
- Same mathematical treatment

External validation						
	NIRS 5000		DS		DS	
	nebl03.eqa		onsebl01.eqa		onmebl01.eqa	
		simple STD		Multiple STD		
Nb Ech. 16	1-VR	SEP	1-VR	SEP	1-VR	SEP
HUM	0,98	0,20	0,97	0,22	0,97	0,23
MAT	0,94	0,29	0,93	0,32	0,94	0,30
CELL	0,64	0,24	0,57	0,26	0,56	0,26
AMIDON	0,74	0,88	0,70	0,94	0,70	0,93

Calibration transfer : multi-instruments

FOSS NIR 5000								Calibration		Validation Croisée	
	Critère	N	Moy	Min	Max	Dev.Std	SEC	RSQ	SECV	1-VR	
BLE + TRITICALE* Nebl03.eqp	HUMIDITE	530	12,5	8,5	16,5	1,33	0,19	0,98	0,20	0,98	
	PROTEINE	538	11,1	8,0	16,0	1,21	0,26	0,95	0,29	0,94	
	AMIDON	513	61,1	56,5	65,5	1,71	0,80	0,78	0,88	0,74	

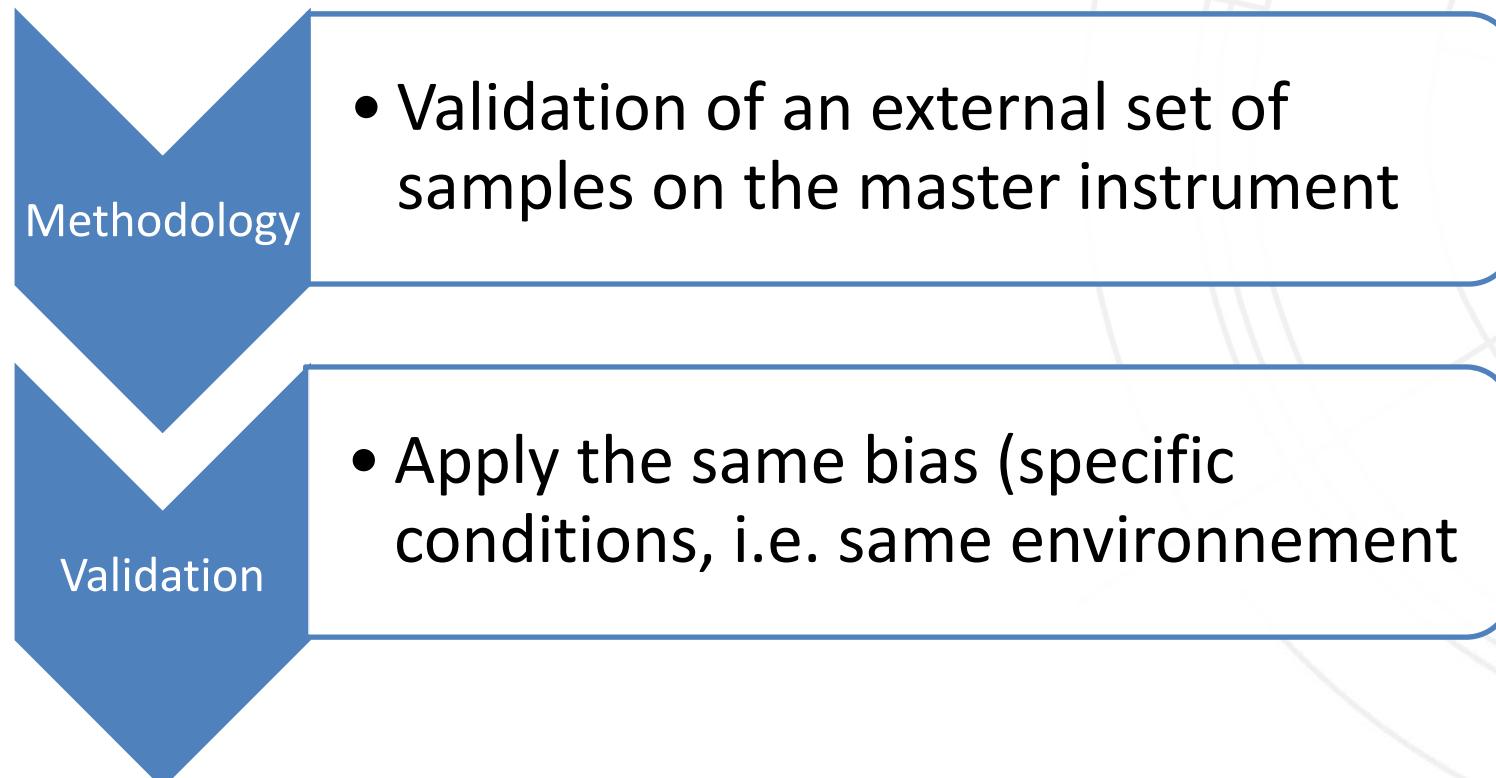
BRUKER MPA TRANSFERED								Calibration		Validation Croisée	
	Critère	N	Moy	Min	Max	RPD	RMSEE	R ²	RMSECV	R ²	
BLE + TRITICALE Entier	HUMIDITE	565	12,9	8,5	16,6	5,73	0,24	0,96	0,26	0,96	
	PROTEINE	553	11,0	7,2	15,8	3,87	0,32	0,93	0,34	0,92	
	AMIDON	546	61,0	56,5	65,5	1,93	0,89	0,72	0,96	0,67	

Network management



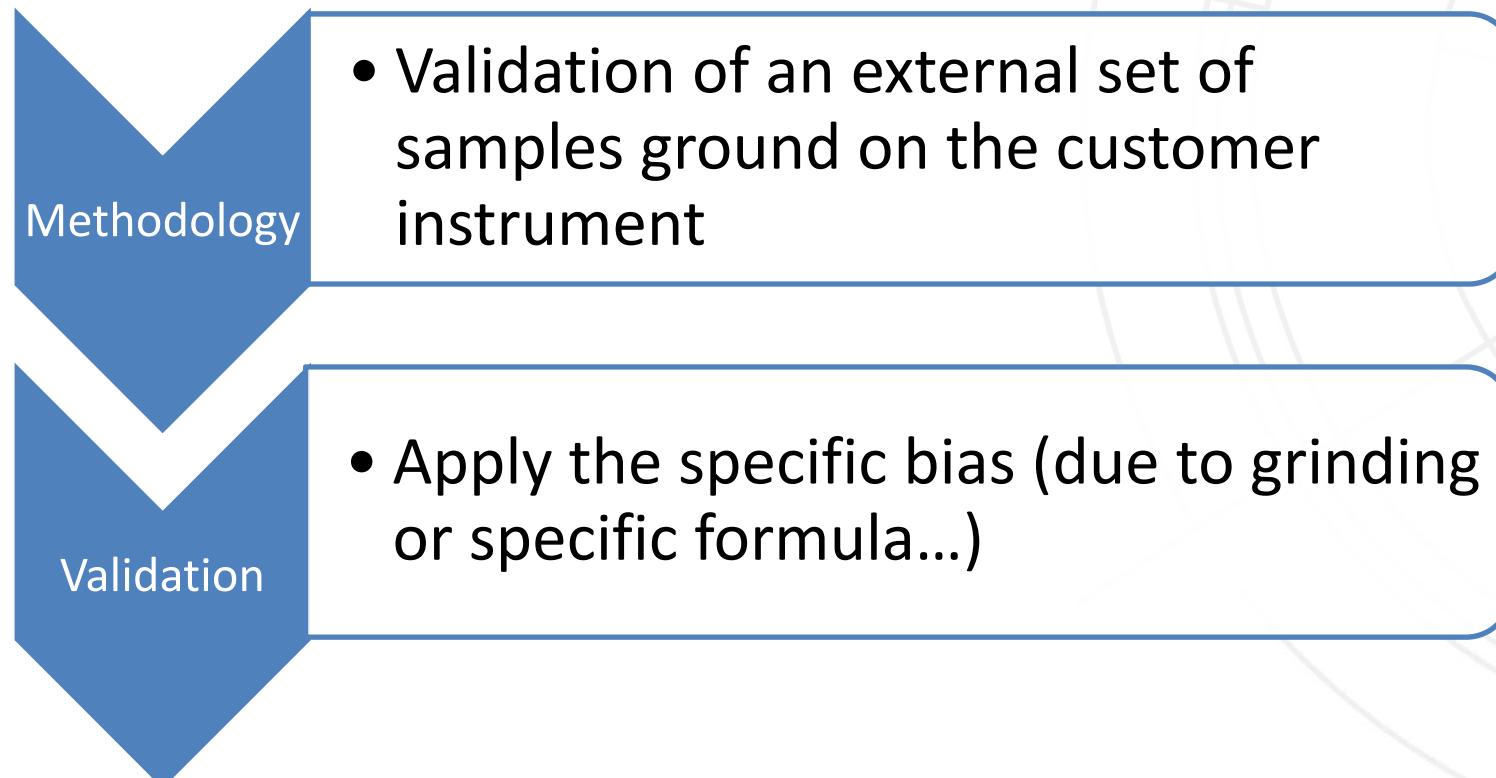
Network management : monitoring

- Target = manage the calibration monitoring
- Example : new technologies benchtop instruments (models for raw materials, unground state)



Network management : monitoring

- Target = manage the calibration monitoring
- Example : new technologies benchtop instruments (models for raw materials, ground state)



Network management : monitoring

Networks	Prediction models (NIRS DS2500)			Summary	Parameter Settings	Links	Licenses	Moisture Compensation	Slope/Intercept			
Parameter Slope/Intercept												
UpScience	Name	Type	Pi									
InfraXact	Alt By Volaille Chair	PLS (ISI format)		AMI [%]	1,000	0,00						
NIRS DS2500	Alt Petfood Dbpét02	PLS (ISI format)	Fir	CELL [%]	1,000	0,00						
XDS	AT Bovin Complet Sulfate	PLS (ISI format)		HUM [%]	1,000	0,00						
	AT Cptre Bovin Sulfate	PLS (ISI format)		MAT [%]	1,000	0,00						
	By Ble	PLS (ISI format)										
	By Ble BQP	PLS (ISI format)										
	By ble extrude Dbbbox01	PLS (ISI format)										
	By BMex	PLS (ISI format)										
	By Corn-Feed	PLS (ISI format)										
	By Dreche Ble	PLS (ISI format)										
	By Dreche Mais	PLS (ISI format)										
	By Graine de soja extrudée	PLS (ISI format)										
Instrument Slope/Intercept												
Networks	Prediction models (NIRS DS2500)			Summary	Parameter Settings	Links	Licenses	Moisture Compensation	Slope/Intercept			
UpScience	Name	Type	Pi									
InfraXact	TQ Alt Volaille - Devco01F	PLS (ISI form		Parameter	Slope	Intercept						
NIRS DS2500	TQ FA Poisson - Defapo01F	PLS (ISI form		Fat [%]	1,000	0,00						
XDS	TQ Mais Jaune - Dema02F	PLS (ISI form		Fiber [%]	1,000	0,00						
	TQ Remouillage - Dere01F	PLS (ISI form		Moisture [%]	1,000	0,00						
	TQ Son de Blé - Deso01F	PLS (ISI form		Protein [%]	1,000	0,00						
	TQ Son de Riz - Desr01F	PLS (ISI form										
	TQ Tx Palmiste - Dtp02F	PLS (ISI form										
	TQ Tx Soja - Dets01F	PLS (ISI form										
	Unground Blood Meal - Defasg01F	PLS (ISI form										
	Unground Corn White - Dema02F	PLS (ISI form										
	Unground Corn Yellow - Dema02F	PLS (ISI form										
	Unground Feather Meal - Defapi01F	PLS (ISI form										
	Unground Fish Feed - Deps01F	PLS (ISI form										
Parameter Slope/Intercept												
Instrument Slope/Intercept												
Networks	Prediction models (NIRS DS2500)			Summary	Parameter Settings	Links	Licenses	Moisture Compensation	Slope/Intercept			
UpScience	Name	Type	Pi									
InfraXact	NIRS DS2500 - Customer 3	Protein [%]	Unground Soybean Meal - Dets01F	1,000	0,50	1,000	0,50					
NIRS DS2500	NIRS DS2500 F - Customer 1	Protein [%]	Unground Soybean Meal - Dets01F	1,000	0,50	1,000	0,50					
XDS	NIRS DS2500 F - Customer 2	Protein [%]	Unground Soybean Meal - Dets01F	1,000	0,50	1,000	0,50					

Conclusion & perspectives

- Network : multi-instruments, multi-brands
- More and more easy to transfer for benchtop instruments with improvement of technologies and tools
- Remote support is easier
- Need to adapt the training regarding the customer environnement and knowledge

ANY QUESTIONS ?



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