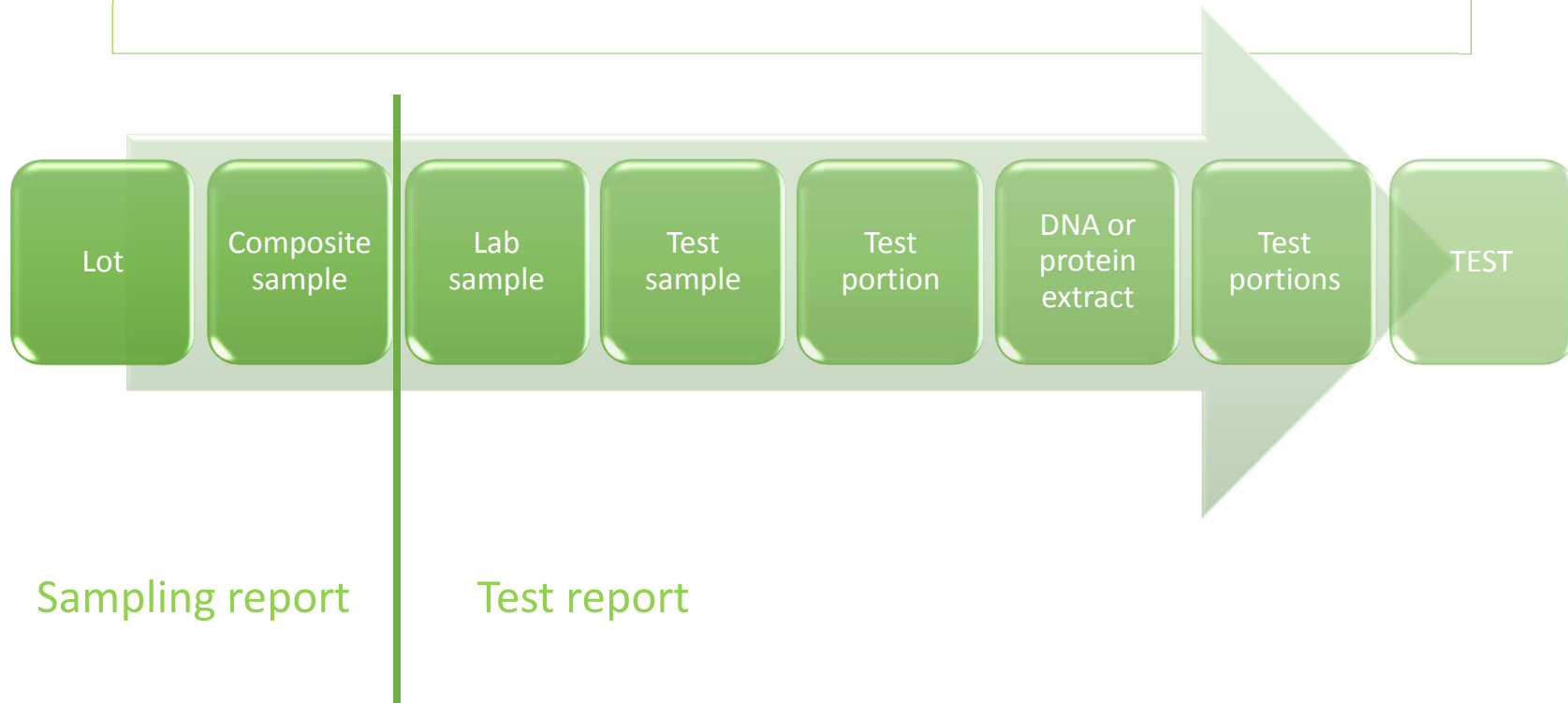


Sampling and challenges to
detect trace amounts of LMOs

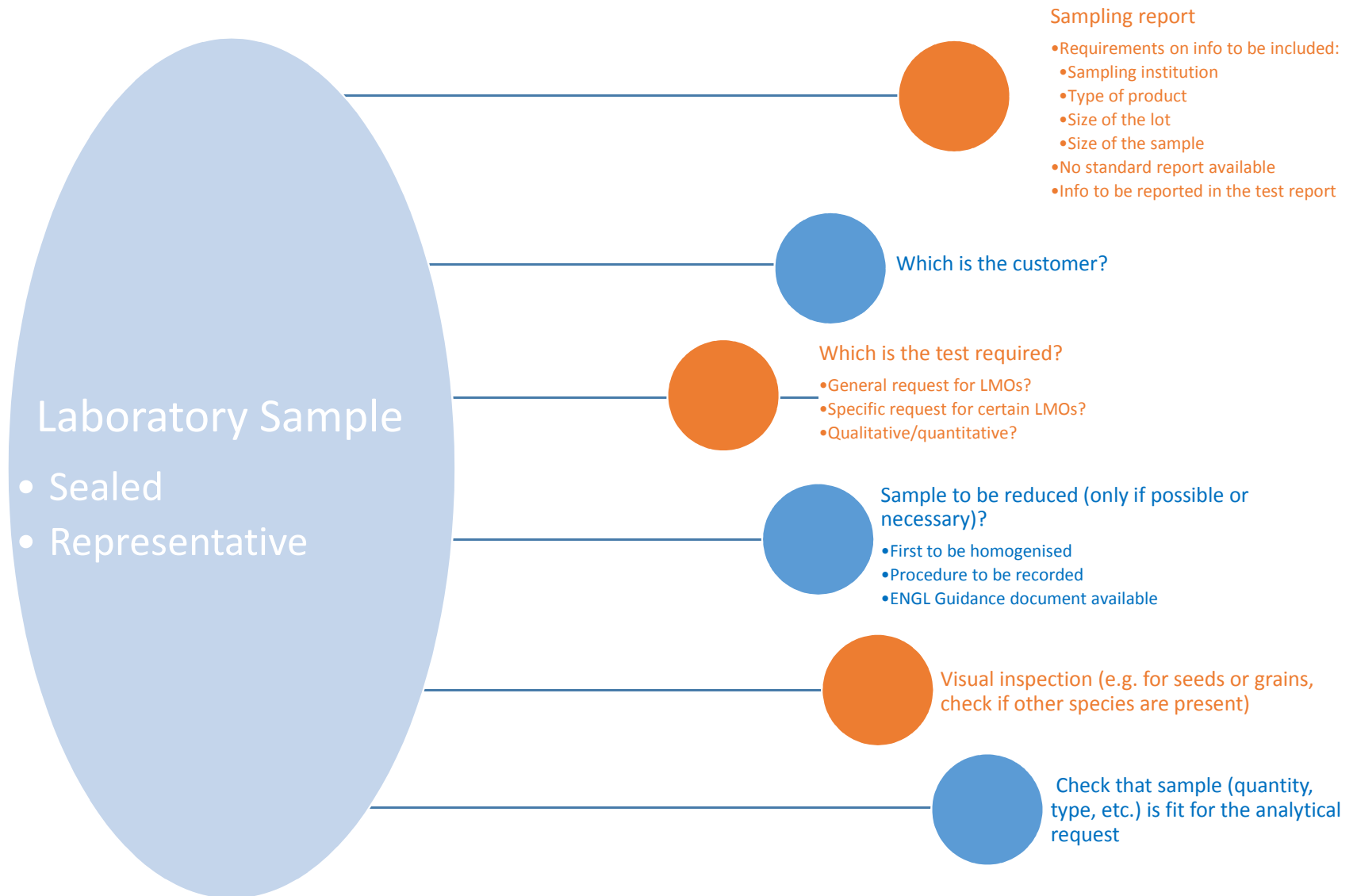
REPRESENTATIVITY



Sampling from Lot to Laboratory sample

- Moving or static
- Bulk grains/seeds
 - Elevator/Silo
 - Ships
 - Trains
 - Containers
- Sacks

- Existing knowledge (not specific for LMOs):
 - ISO 24333
 - ISTA
 - GIPSA
 - CGC
 - ISO 542
 - AOSA
 - ...



Principle of sampling

- Need to know in order to perform the various sampling steps (sampling, subsampling, preparation of the test portion, subsampling DNA or protein extract for analysis)
- Two main issues:
 - Representativity \Rightarrow ISTA & other available standards
 - Uncertainty \Rightarrow SeedCalc

Uncertainty

- Qualitative tests \Rightarrow Level of Confidence that the GMO content is below a certain level
- Quantitative tests \Rightarrow SeedCalc may be used to estimate uncertainty associated to sampling and to each subsampling step. Then all uncertainty contributions have to be combined.

		Number of units				
		1	10	100	1000	10000
LMO content	0%					
	50%		x		x	x
	100%					

To be combined

Difficulties in identifying and quantifying trace amounts of GMOs

- Practicability
- Type of material
- Limited sensitivity of methods
- Define what we mean with “trace amounts”

Practical exercise in sampling

- Prepare different case studies where we show representativity and uncertainty associated with different sampling procedures
- Video on practical exercise with black and white beads
- Also written text