ALLERGEN MANAGEMENT FOR FOOD MANUFACTURERS

Training Course

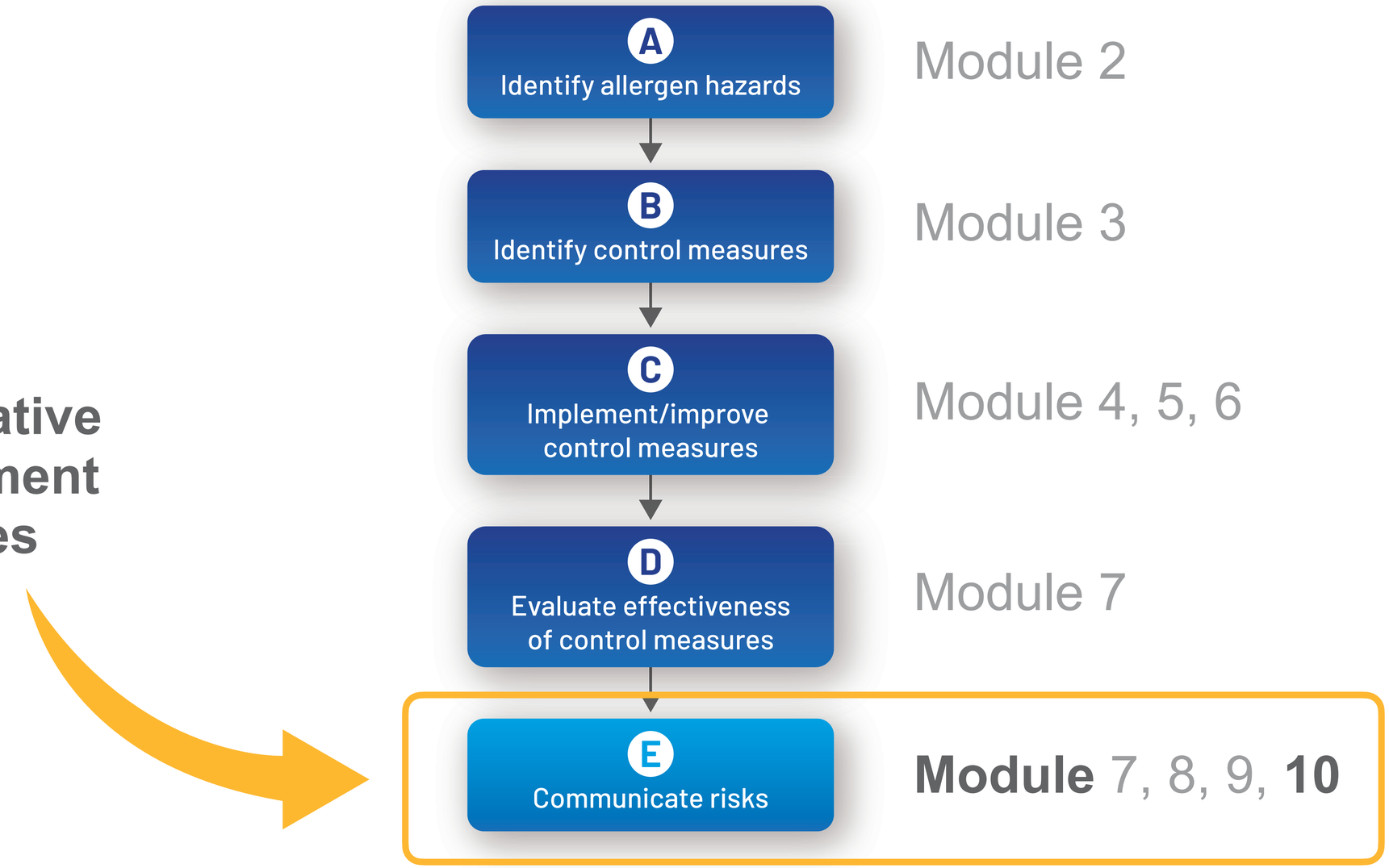
MODULE 10

Communicate risks

- Examples of quantitative assessment

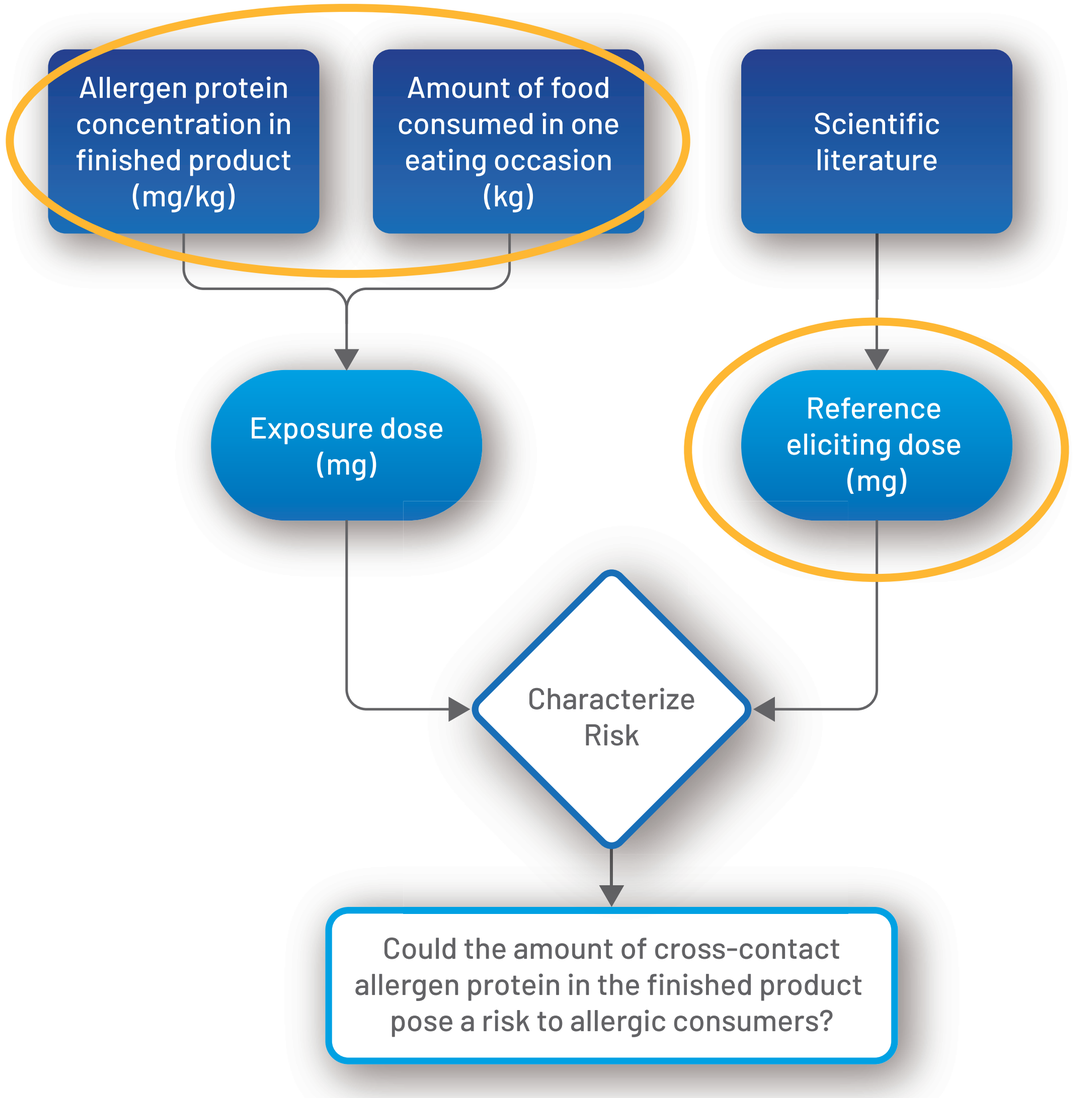
DEVELOPMENT OF AN ACP

Quantitative assessment examples



QUANTITATIVE RISK ASSESSMENT

- Worst-case scenario at every step of the assessment = safety margin



EXAMPLES

- Quantitative assessment for PAL
- Examples are simplified and must not be taken as conclusive recommendations

EXAMPLE 1: RAW MATERIAL WITH PAL

Context

- Chips manufacturer
- Ingredient = seasoning mix with PAL for soy
- Carry forward?

Allergen	Recommended reference dose (mg total protein from the allergenic source)		
	VITAL scientific expert panel (2019)		FAO/WHO expert consultation (21/22)*
	ED01	ED05	ED05
Soy	0.5	10.0	–

Reference ED

Food consumption

- CCHS 2015, savory snacks
- 2 bags of chips (56 g) = between mean and P90

EXAMPLE 1: RAW MATERIAL WITH PAL

Allergen concentration in the finished product

Soy protein concentration in spice mix

Allergenic food	Protein content (%)
Whole soybean	40

total soy flour × protein fraction in soy flour

Soy protein = 15 × 0.40 = 6 mg soy protein per kg spice mix

For 100 kg of chips

- 12 kg spice mix (per recipe), which contain 12 x 6 = 72 mg soy protein
- 6% weight loss during baking
  → after baking = 94 kg of chips

Soy protein concentration in chips:
72 mg / 94 kg = 0.77 mg soy protein per kg chips

EXAMPLE 1: RAW MATERIAL WITH PAL

0.056 kg

0.77 mg/kg

Allergen protein concentration in finished product (mg/kg)

Amount of food consumed in one eating occasion (kg)

Scientific literature

0.77 mg in 1 kg
*→ in 0.056 kg = **0.043 mg***

Exposure dose (mg)

Reference eliciting dose (mg)

VITAL ED01= 0.5 mg

Characterize Risk

Could the amount of cross-contact allergen protein in the finished product pose a risk to allergic consumers?

0.043 mg < 0.5 mg
*→ **No PAL***

EXAMPLE 2: CARRY OVER MATERIAL

Context

- Small manufacturer
- Changeover procedures don’t eliminate residues

Reference ED

Allergen	Recommended reference dose (mg total protein from the allergenic source)		
	VITAL scientific expert panel (2019)		FAO/WHO expert consultation (21/22)*
	ED01	ED05	ED05
Mustard	0.05	0.4	–

Food consumption

- Internal data
- 75 g sausage x 3 = 0.225 **kg**

EXAMPLE 2: CARRY OVER MATERIAL

Allergen concentration in the finished product

Amount of mustard **powder** in hang-up material $\frac{0.05 \times 0.6}{100} = 0.0003\ kg$

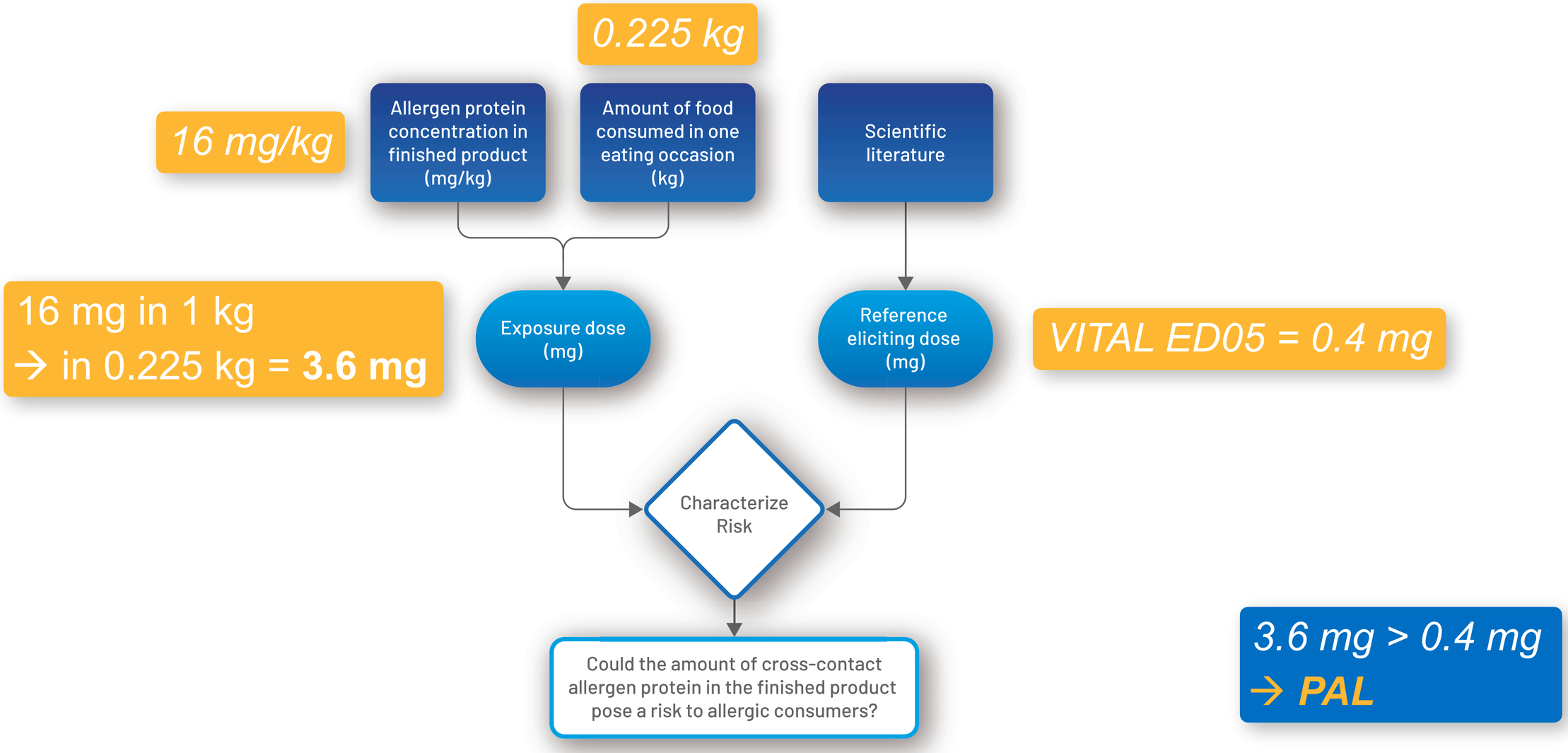
Amount of mustard **protein** in hang-up material

Allergenic food	Protein content (%)
Mustard seed	26

Mustard protein in 0.0003 kg mustard powder =
0.0003 × 0.26 = 0.000078 kg = 78 mg ≈ 80 mg

Concentration of mustard protein in affected product:
80 mg / 5 kg = 16 mg/kg

EXAMPLE 2: CARRY OVER MATERIAL



SUMMARY

Examples of quantitative assessment to inform PAL decisions

- ✓ Data
- ✓ Computations
- ✓ Interpretation of results

COURSE SUMMARY

Goal: How to develop an ACP

- Foundation = hazard ID
- Recognized allergen management practices
- Understand effectiveness of control measures
- PAL informed by risk assessment

Outputs

- Robust allergen management by food manufacturers
- Better meet the needs of allergic consumers

Developed by:

Université Laval

Oparera
Food Risk Analysis and Regulatory Excellence Platform

Food Allergy Canada

Funded by:

Canadian Agricultural Partnership

Canada