

LC-MS/MS: uno strumento essenziale per il controllo degli alimenti

Francesco Pio Prencipe, PhD
Head of R&D Department

neotron
Part of the Cotecna Group

UNIMORE, 06 Novembre 2024





neotron
— Part of the Cotecna Group

Neutron key figures



51 +

M€ Turnover



550+

Employees



10000

m² Lab / 1 Plant



1000+

Samples/day



Business
Break-down
57% IT
39% EU
4% ex-EU



800+

Methods



5000 +

Accredited Tests



>99,5%

P-tests Target



70%

Tests Contaminants

Controllo degli alimenti

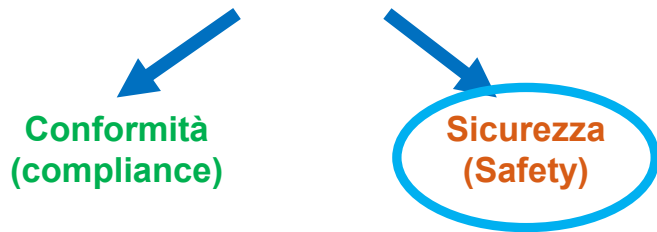
```
graph TD; A[Controllo degli alimenti] --> B[Conformità (compliance)]; A --> C[Sicurezza (Safety)];
```

The diagram illustrates the components of food control. At the top, the title 'Controllo degli alimenti' is written in blue. Two blue arrows point downwards from this title. The left arrow points to the text 'Conformità (compliance)' in green. The right arrow points to the text 'Sicurezza (Safety)' in orange, which is enclosed in a light blue oval. The background features decorative diagonal bars: a blue one in the top right and a green one in the bottom left.

**Conformità
(compliance)**

**Sicurezza
(Safety)**

Controllo degli alimenti



**Perchè l'LC-MS/MS è
considerato uno
strumento essenziale?**

(PRINCIPALI) CONTAMINANTI

- Pesticidi ✓ LC-MS/MS
- Micotossine ✓ LC-MS/MS
- Metalli pesanti
- Alcaloidi ✓ LC-MS/MS
- POPs (diossine, PAH, etc...)
- Contaminanti di processo (acrilamide, furano, etc...)
- Farmaci veterinari ✓ LC-MS/MS
- Coloranti non ammessi ✓ LC-MS/MS

PUNTI DI FORZA DELL'LC-MS/MS

- ✓ **Sensibilità**
- ✓ **Selettività**
- ✓ **Versatilità (adatta a molte tipologie di contaminanti)**
- ✓ **Efficienza (analisi simultanee di più contaminanti)**
- ✓ **Quantificazione accurata**

Sensibilità (LoQ)

$$\mu\text{g/kg} = \text{ppb}$$



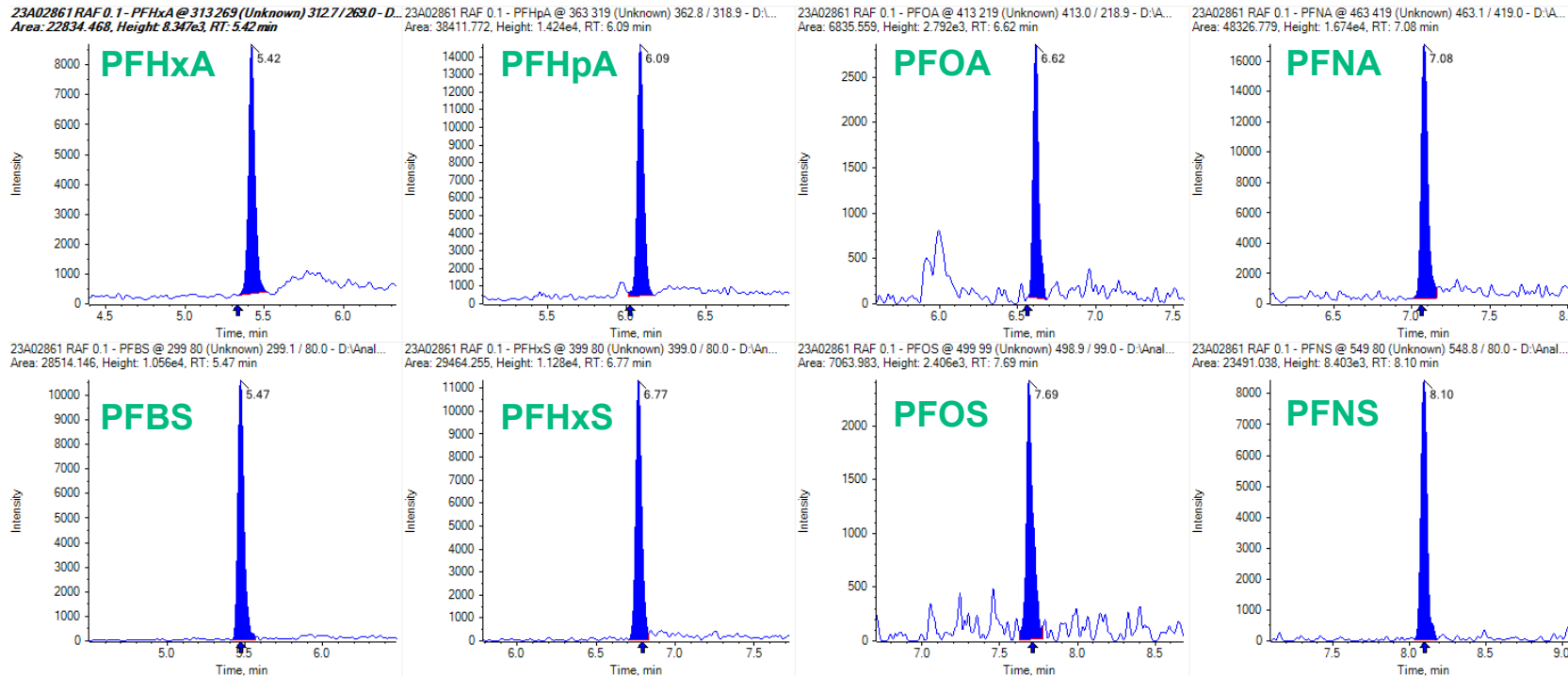
7'840'000'000

→ 1 ppb = 8 persone

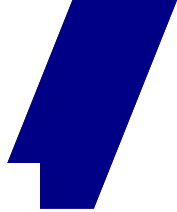
→ 0,1 ppb = 0,8 persona

Sensibilità (LoQ)

Campione addizionato con una miscela standard di PFAS a 0,1 ug/kg (ppb)



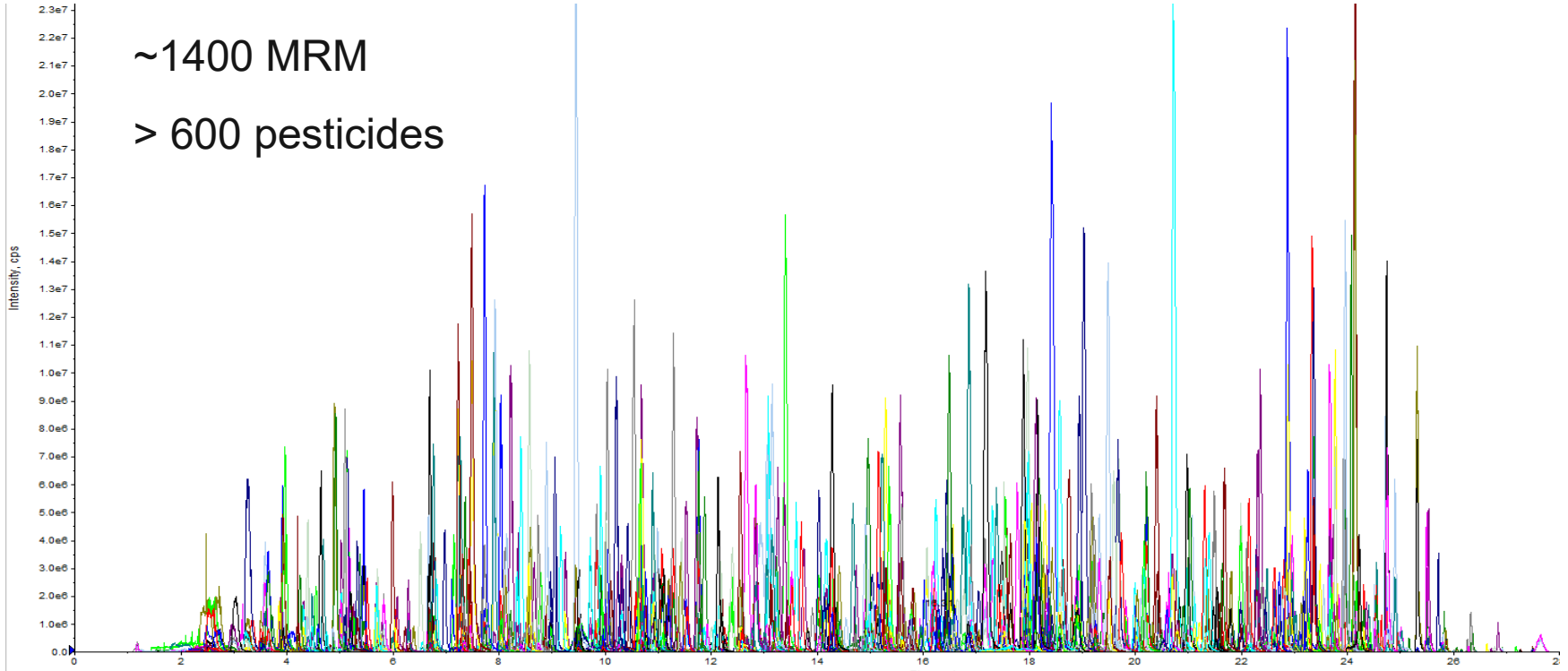
Selettività



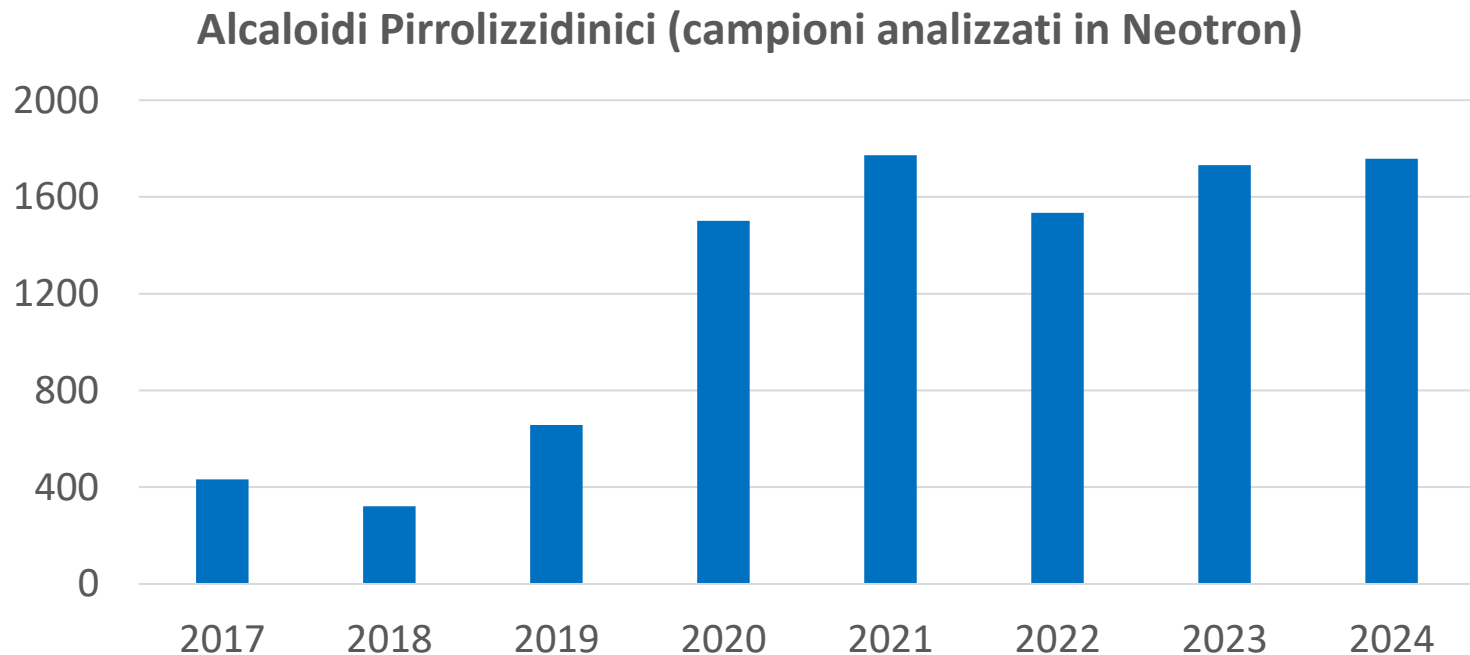
Efficienza, Versatilità

~1400 MRM

> 600 pesticides

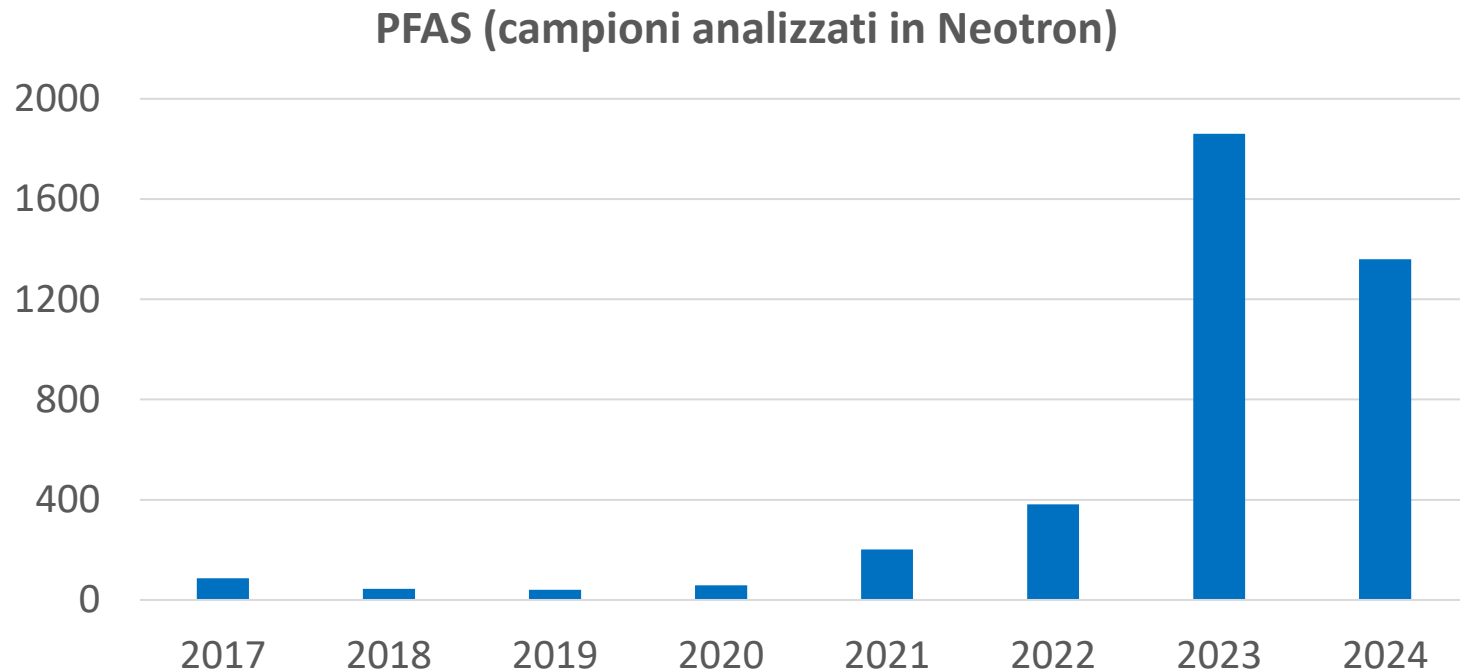


Alcaloidi pirrolizzidini



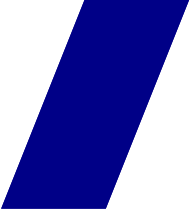
Reg. UE 2040/2020 Dicembre 2020

Sostanze poli- e perfluoroalchiliche (PFAS)



Reg. UE 915/2023 gennaio 2023

CONCLUSIONI

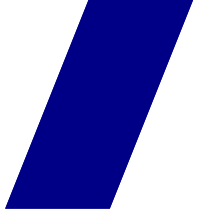


LC-MS/MS

- Strumento complesso
- Valutazione dati «grezzi»

Analista

- Knowledge (background)
- Know-how
- Expertise



THANK YOU