

# The application of M3 HP10 rotor in the determination of multiple elements in chicken

## 1. Introduction

Heavy metal pollutants accumulation in livestock product is vital to human health and food safety. The evaluation of the heavy metals accumulations and the amount of certain elements are important studies in food safety and food nutrition field. The accurate analysis on metal elements inside the livestock product as chicken provides a guideline method for the determination of metal element in different food matrix. M3 as microwave digestion system ensures a simple and accurate sample preparation process in the determination of elements in food.

## 2. Instrument and reagent

Instrument:

The digestions were carried out with M3 microwave digestion system and HP 10 high pressure digestion vessels. The determination of the trace element was conducted by ICP-MS.



M3 microwave digestion system



HP10 rotor



G-160 hot block

Reagent:  $\text{HNO}_3$ (GR)

Sample: GSB-9 biological composition analysis standard material-chicken

## 3. Method

1. Weigh 0.5 g chicken quality control samples in to sample cup.
2. Add  $\text{HNO}_3$  into the sample cup swirl the cup to mix the sample and acid thoroughly.
3. Add the same amount of  $\text{HNO}_3$  into the sample cup as sample blank, then seal the vessel.
4. Set the microwave digestion program as shown in table 1:

Table1: Microwave digestion program

Step	Setting temperature( $^{\circ}\text{C}$ )	Ramp time (min)	Temperature holding (min)
1	140	8	5
2	190	8	20

5. Take the vessels out of the cavity when the temperature falls under 60 °C.
6. Open the vessels and place them on the hot block to evaporate acid. Dilute the sample to 50 mL with deionized water when the temperature of the vessels cools to room temperature.
7. The final solutions were tested by ICP-MS.

#### 4. Result

Table 2: ICP-MS measurement result for GSB-9

n=3

Element	Found value (mg/kg)	Certified value (mg/kg)	Recovery (%)
As	0.105	0.109 ± 0.013	96.3
	0.100		91.7
	0.102		93.6
Se	0.460	0.490 ± 0.06	93.9
	0.478		97.6
	0.462		94.2
Pb	0.097	0.11 ± 0.02	88.2
	0.100		90.9
	0.099		90.0

As shown in the result, the method present good stability and accuracy in the determination of different heavy metals in chicken products.

#### 5. Conclusion

Preekem's M3 microwave digestion system coupled with HP10 rotor can digestion the chicken product thoroughly to a clear solution. Thanks to the advanced full vessel real-time temperature monitor and pressure control technique, the digestion unit not only ensures the safe and precise sample digestion but also improves the accuracy and stability during the experiment.