**Figure S1**: Linear regression of total curcumin (%) concentration extracted and analysed by UV-Vis and HPLC (**a**) and boxplot showing total curcumin (%) concentration of triplicate analysis conducted for $n = 3$ of each variety of yellow (Y), orange (W) and red (S) turmeric rhizomes (**b**). To validate the HPLC method triplicate replications using three samples of each variety were analysed by both HPLC and UV-Vis to correlate results. Samples were prepared and analysed using the HPLC method above and Genesis 20 UV-Vis spectrometer in Shimadzu quartz crystal cuvettes with 10 µm light path at 425 nm (Thermo Scientific, Waltham, Massachusetts, USA). Curcumin concentration values for both instruments were correlated with R^2 = 0.999994 (Figure S1a). Confirming accuracy of the HPLC method. Curcumin (%) concentration for the triplicate samples in the HPLC method validation set are presented in (Figure S1b).
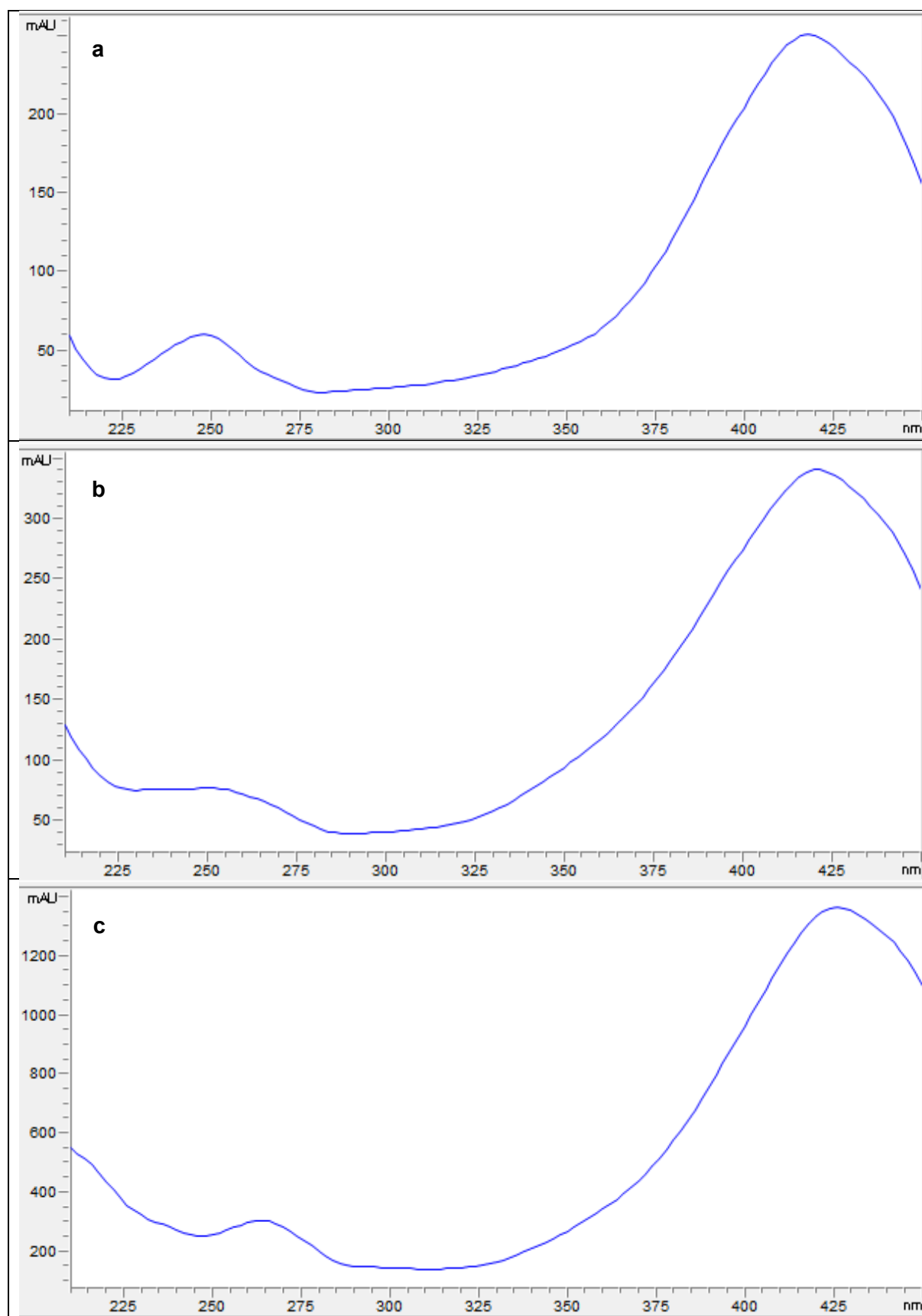
Figure S2. Spectral peaks used to identify the curcuminoids at retention time bisdemethoxycurcumin at 3.349 min (**a**), demethoxycurcumin at 3.3593 min (**b**), and curcumin at 3.844 min (**c**).

HPLC Method

Sample Preparation	COST (AU$)	TIME (hrs)
Sample prep labour (4 sample per hour plus re-agent prep and washup) $54.29 /hr x 0.25	$13.57	0.25
Chemical Reagents (ACN, MilliQ) and Consumables (Cucumin Standard, Acetone, Detergents, Vials, Filters, Pipettes)	$5.00	
Laboratory instruments use and maintenance (Fume hood, Blender, Sonicator)	$5.00	
Laborotory operating costs	$10.00	
Sample Analysis		
Instrument Hire and Running Cost (per sample inc. labour)	$10.00	0.25
Chemical Reagents (ACN, MilliQ)	$5.00	
Consumables (vials, filters, pipettes)	$5.00	
Labour	$10.00	
Sample data extraction and interpretation	$20.00	
Subtotal	$83.57	
Goods and services tax 10% GST	$8.36	
TOTAL COST PER SAMPLE HPLC	**$91.93**	**0.5 hrs (30min)**
Labour rate: OA step 1 with oncosts $54.29 per hour		
Require HPLC instrument AUD $70,000 ex. GST		

Hyperspectral Method

Initial PLSR Model Development	COST (AU$)	TIME (hrs)
Sample prep and scanning labour (inc calibration) for 150 samples (6 min each) (54.29 * 15)	$814.35	**15.00**
Data extraction and preprocessing (n=150 x 3min ea) (54.29 * 7.5)	$407.18	**7.50**
PLSR model development and vaidation (1 week) (54.29*36)	$1,954.44	**36.00**
Two weeks software (The Unscrambler) license pro rata (AU$2,350.48/yr/26)	$90.40	
Traditional reference (HPLC) of 150 samples (as calc. above)	$13,789.46	**75.00**
Subtotal	$17,055.83	
10% GST	$1,705.58	
INITIAL PLSR MODEL DEVELOPMENT	**$18,761.41**	**133.5 (hrs)**
New sample analysis		
($54.29 * 0.1) 6min	$5.43	**0.10**
Data extraction, preprocessing and entry ($54.29 * 0.05) 3min ea	$2.71	**0.05**
Prediction using developed PLSR model (30min for n=30)	$0.90	**0.02**
One day software (The Unscrambler) license pro rata (AU$2,350.48/yr/365)	$10.96	
Subtotal	$20.01	
10% GST	$2.00	
TOTAL COST PER NEW SAMPLE HSI	**$22.01**	**0.166 (~10min)**
Labour rate: OA step 1 with oncosts $54.29 per hour		
Require bentop HSI reflectance system with PikaXC2 camera AUD 55,984 ex. GST		

Figure S3. Cost-benefit analysis comparing traditional laboratory based HPLC curcumin detection and prediction using hyperspectral imaging and PLSR methods.