1 **Supporting information**

2 Supplemental Figures

3 (A)



**Biplot (axes F1 and F2: 98.84 %)**

F2 (25.81 %)

F1 (73.03 %)

18 (B)

**Biplot (axes F1 and F2: 81.74 %)**

F2 (34.91 %)

F1 (46.82 %)
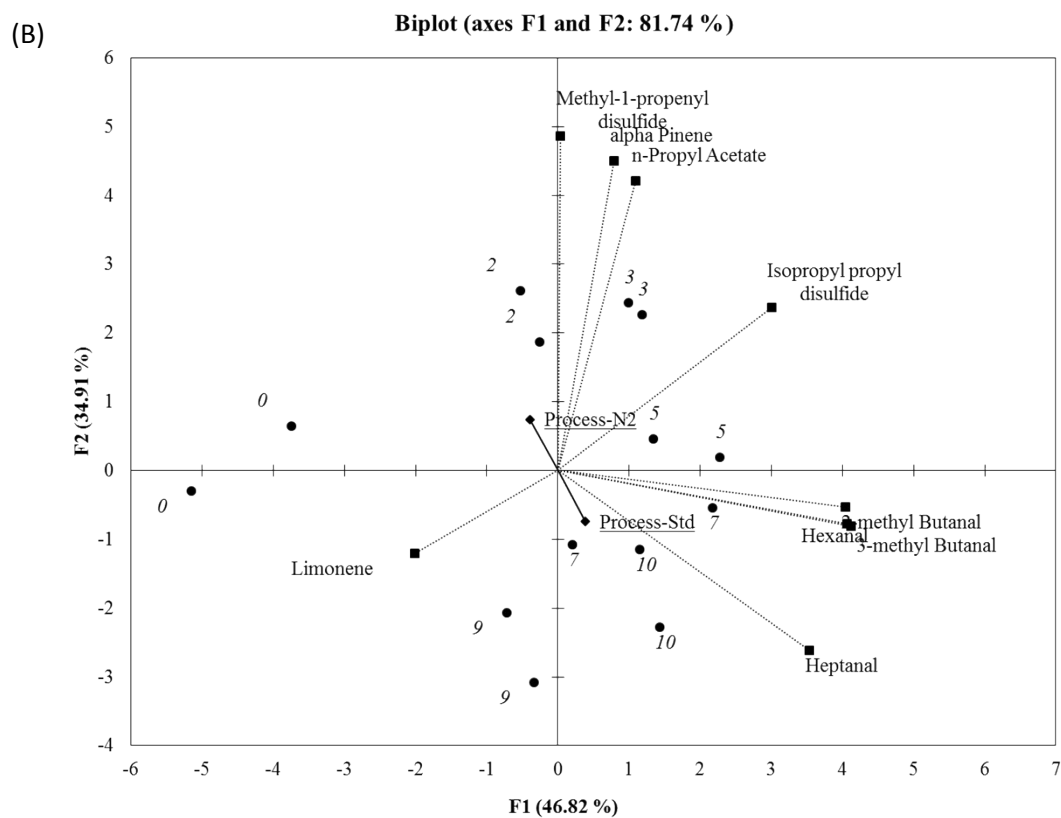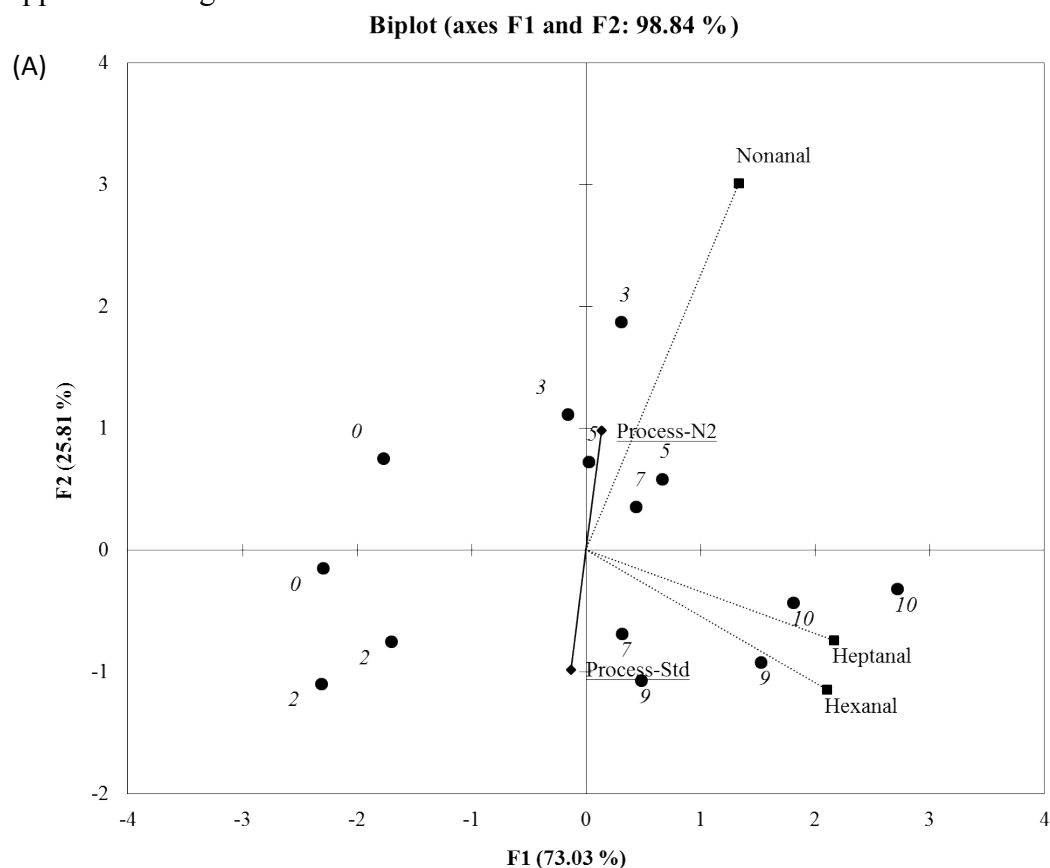
32 ***Figure S1:*** *Principal component analysis map (PC1 and PC2) involving the quantities of the*

33 *significant components such as different packaging environment (underlined), storage time*

34 *(italic) and volatile compounds attributes, where (A) Unsalted potato crisps, and (B) Cheese*

35 *& onion seasoned potato crisps.*

36 *Summary of all samples via Principal Component Analysis*

37 Principal component analysis (PCA) was used to illustrate the difference between all volatiles

38 associated with unsalted and C&) seasoned potato crisps with increasing storage time and

39 controlled packaging environment. For unsalted crisps, the first principal component (PC1)

40 accounted for 73.03% of the variance in the dataset and showed a trend with the amount of

41 aldehydes from top to bottom and different storage time. The second principal component

42 (PC2) accounted for 25.81% of the variance and showed separation between the $N_2$ gas flushing

43 (top) and without $N_2$ gas flushing packaging (bottom). Similarly, for cheese & onion seasoned

44 potato crisps, the first principal component (PC1) accounted for 46.82% of the variance in the

45 dataset and showed a trend with terpenes, acetate and disulphides (top) and aldehydes (bottom)

46 and different storage time. The second principal component (PC2) accounted for 34.91% of

47 the variance and showed separation between the packaging environments *i.e.,* crisps packed

48 with $N_2$ gas flushing (top) and crisps packed without $N_2$ gas flushing (bottom). Disulphides and

49 terpenes were positively correlated and aldehydes such as hexanal, heptanal were negatively

50 correlated. There were visible differences between packaging environment (*i.e.* with or with

51 $N_2$ gas flushing) with both unsalted and C&O seasoned potato crisps, characterised by these

52 samples being located in different corners of the PCA plot.