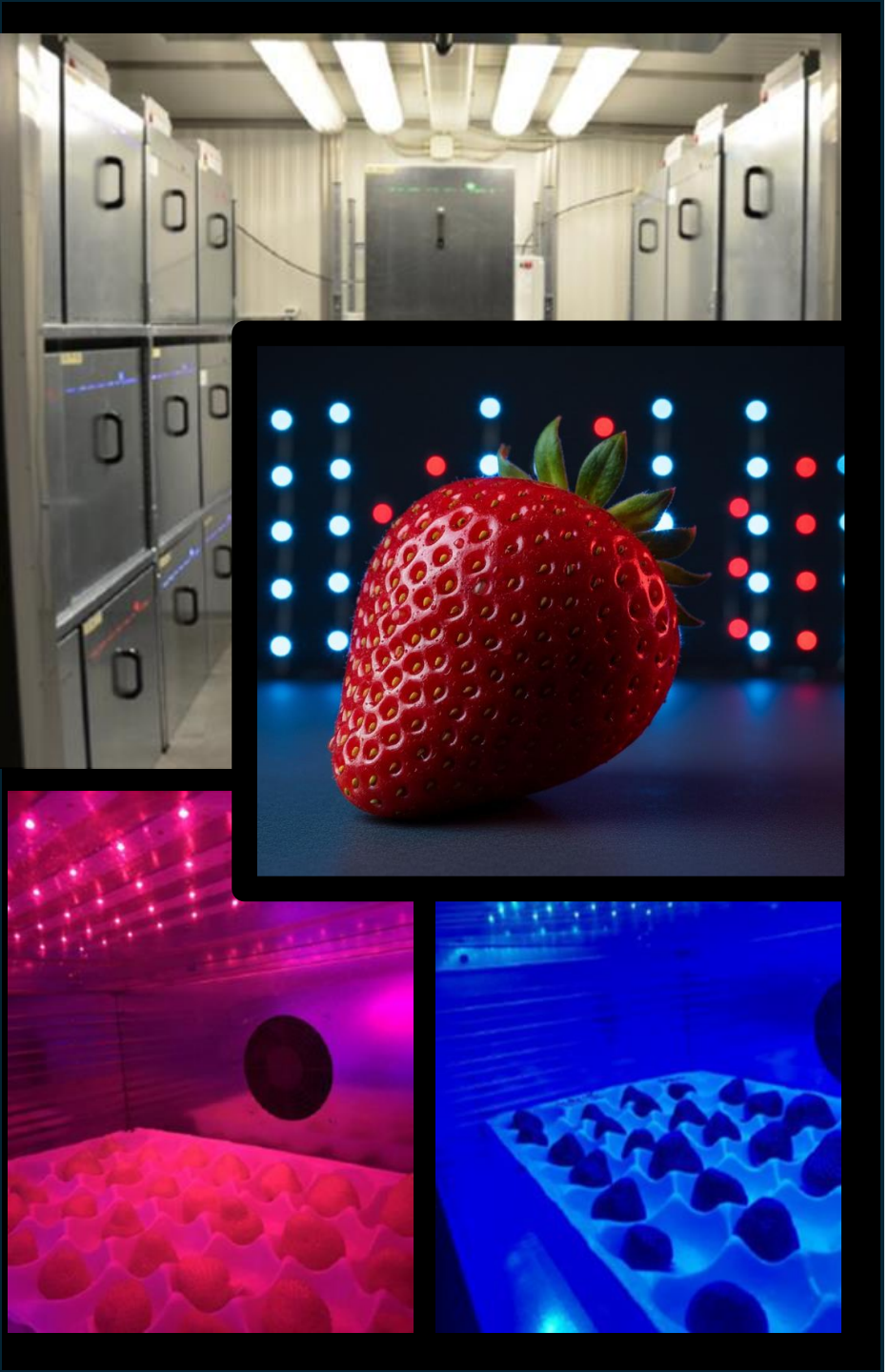


Impact of **postharvest** **LED light** treatments on strawberry quality during cold storage

Brian Farneti

5TH INTERNATIONAL STRAWBERRY CONGRESS

FONDAZIONE EDMUND MACH dal 1874

Fresh Strawberry Supply Chain with FLW Rates by Stage

Farm

~36% FLW

Cooler

Check → Cool → Transport

1-4 days

1-4 hours

~2% FLW

Distribution Center

Check → Warehouse → Transport

1-6 days

0 hours

~0.5% FLW

Store

Display → Sell

0-3 days

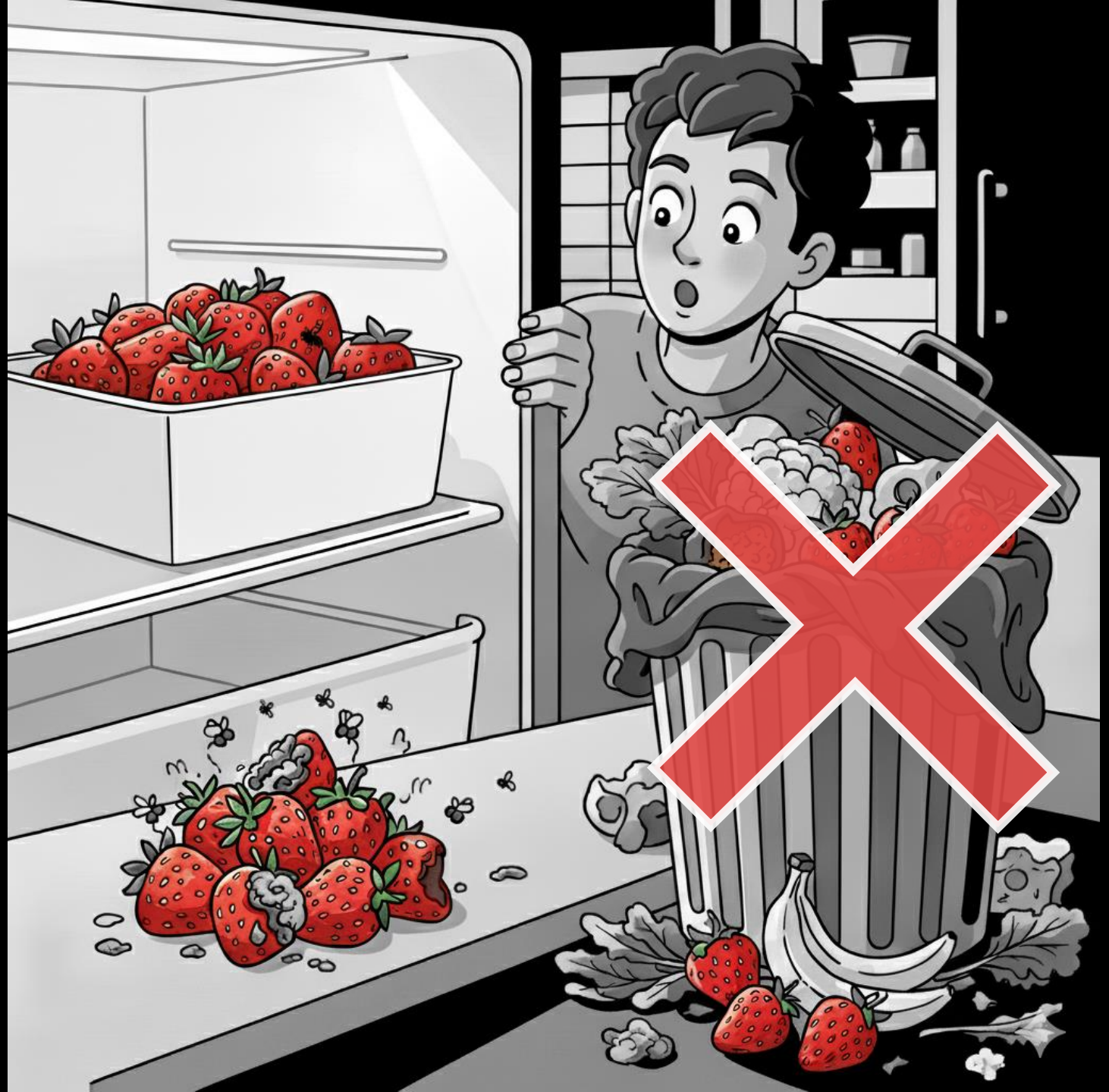
0-3 hours

~9% FLW

Total time spent in stage

Typical time spent in ambient temperature

% FLW is the portion of the total matured or received strawberries lost or wasted *within each stage*.

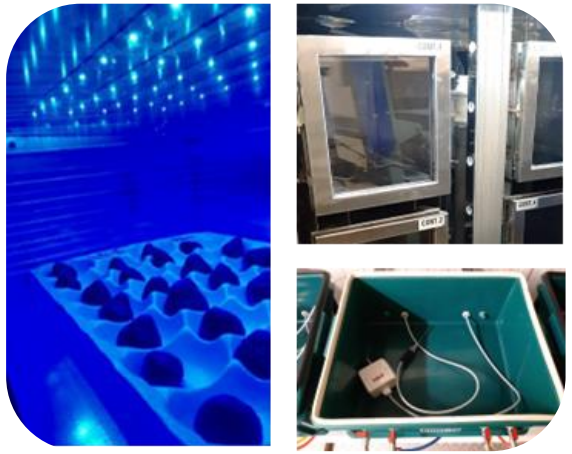



360°
STRATEGY

Germplasm

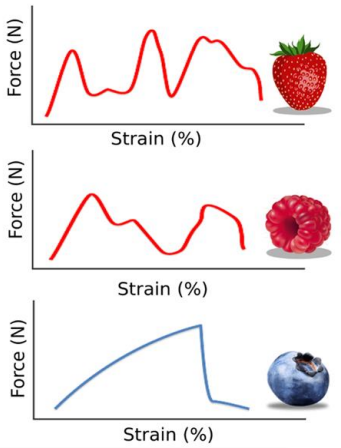
Cultivation

Postharvest

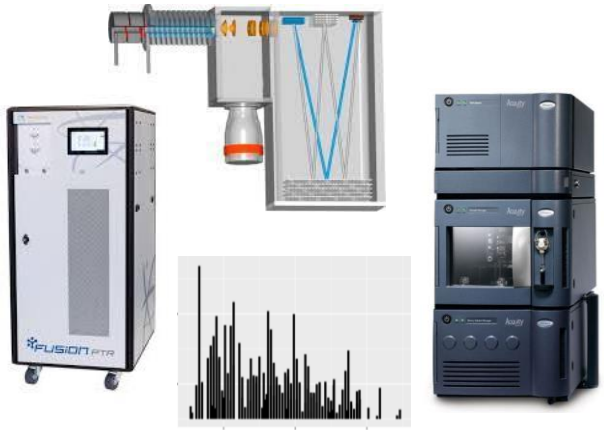


Quality

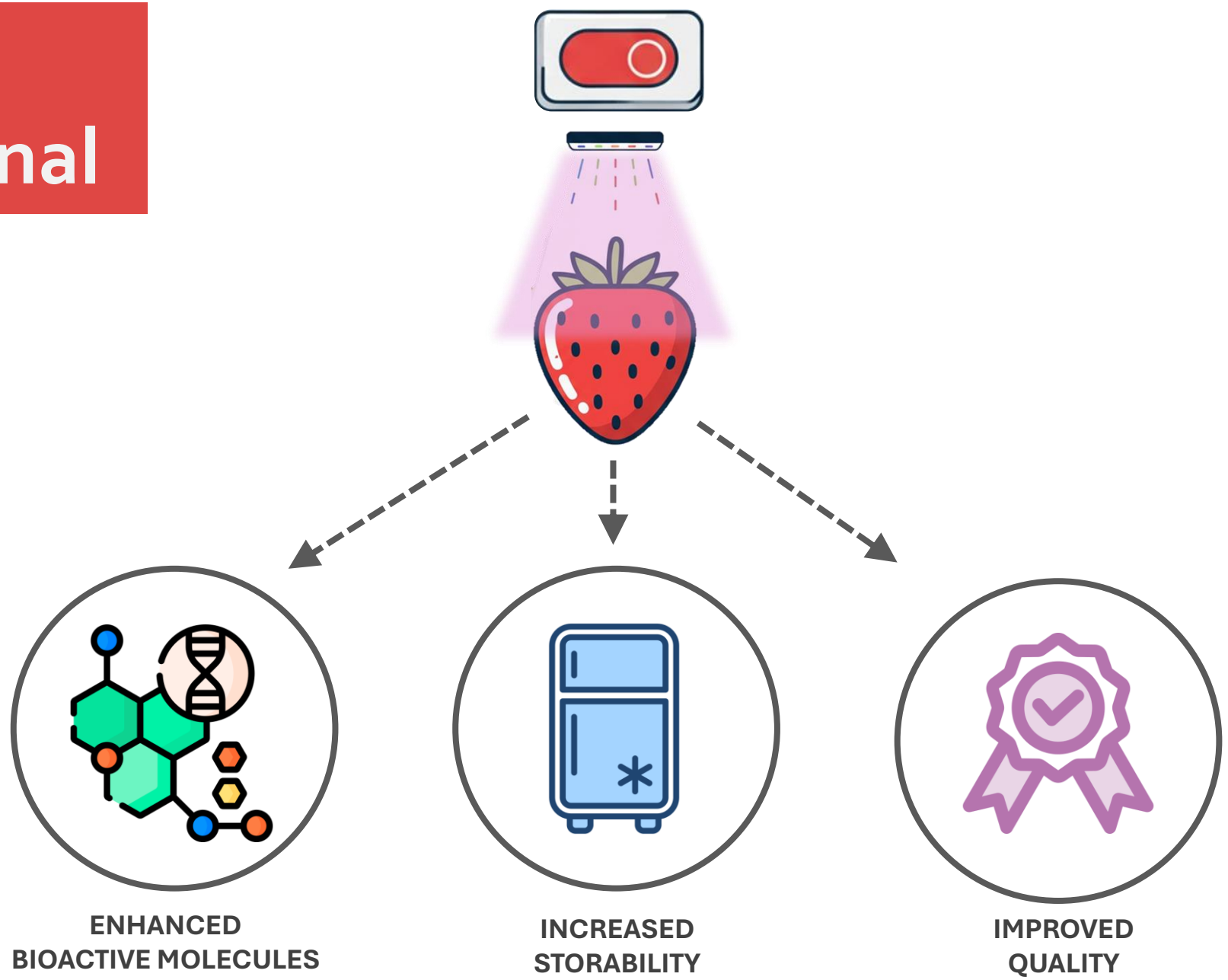
Texture



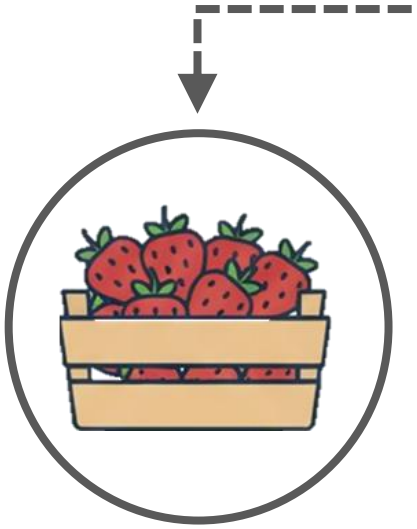
Omics



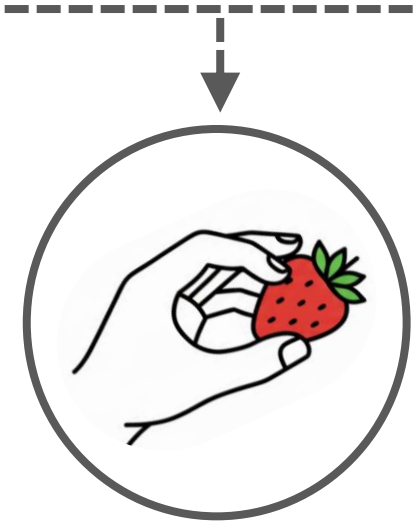
Light as a ‘PRIMING’ signal



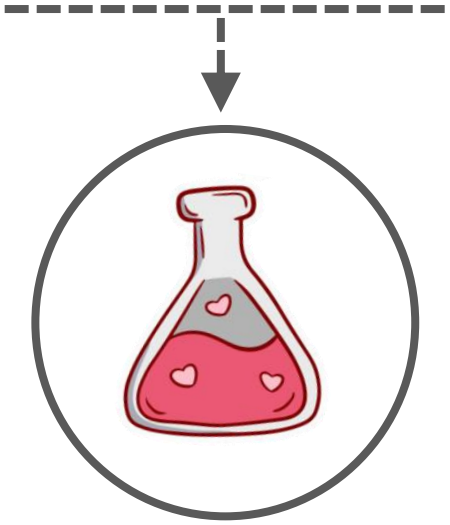
UV-A	BLUE	RED	FAR-RED



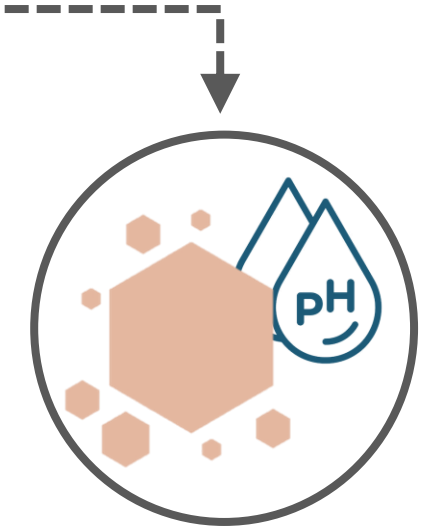
PRODUCTIVITY



FIRMNESS



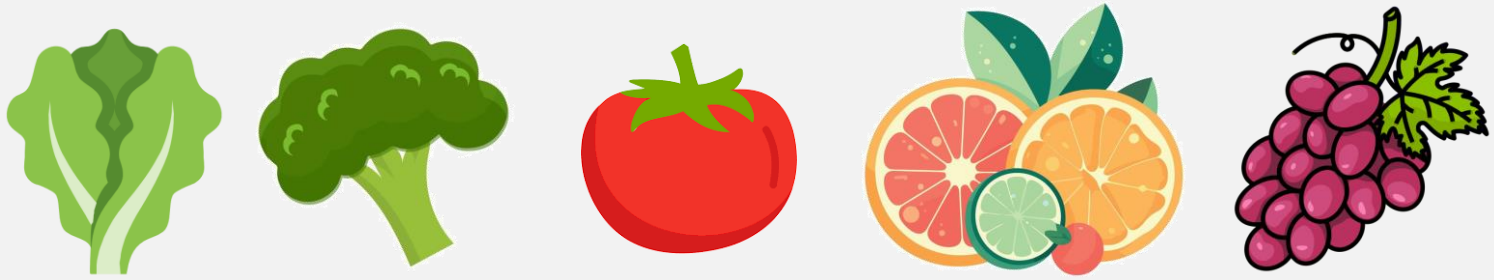
ANTHOCYANINS

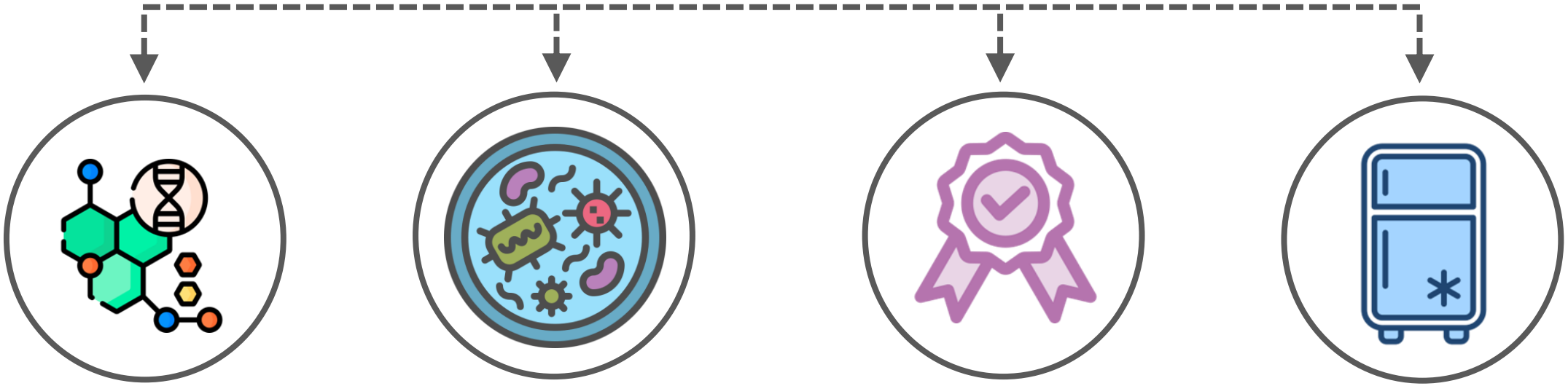


SUGAR / ACID

STORAGE

UV-A | BLUE | RED | FAR-RED



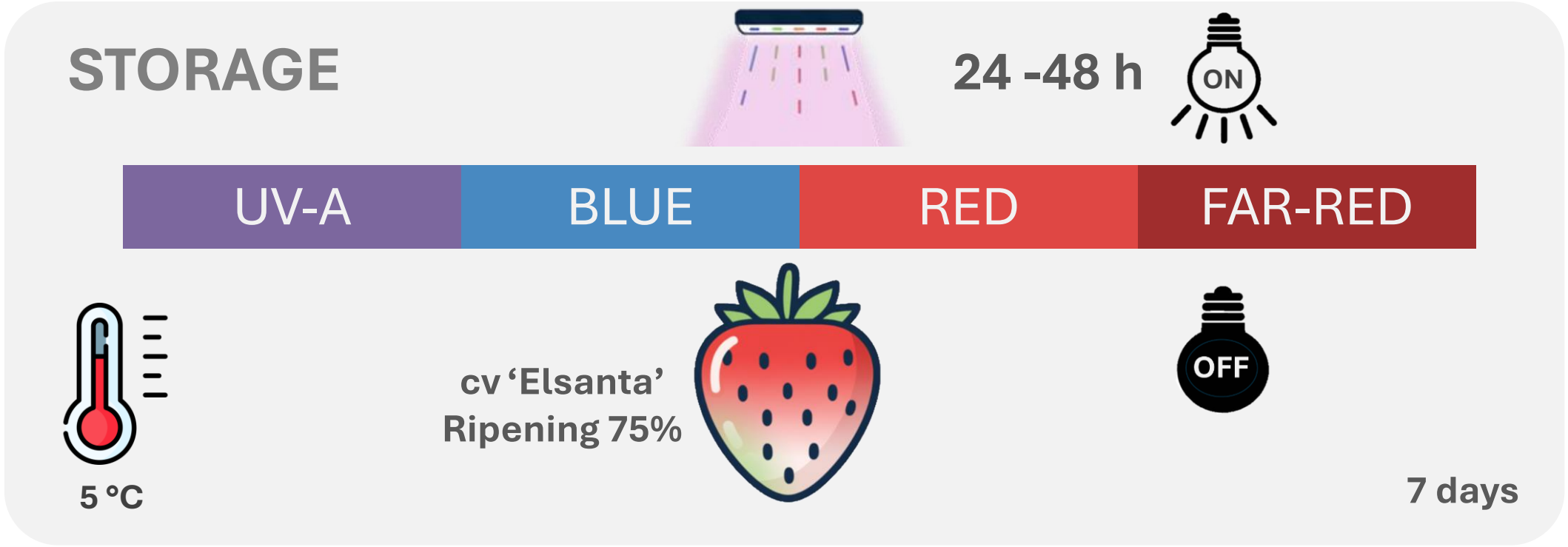


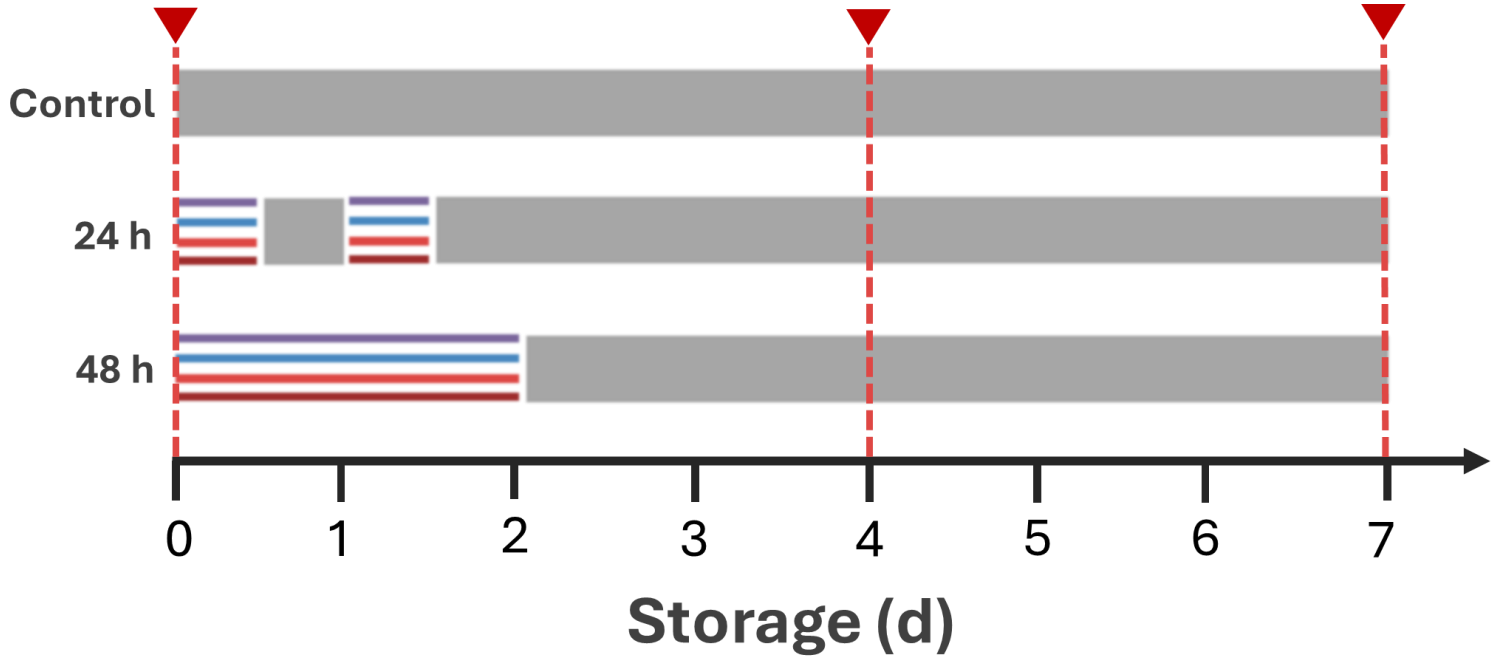
BIOACTIVE MOLECULES

RESISTANCE

QUALITY

STORABILITY

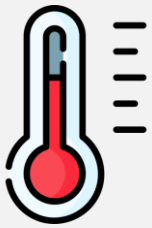

STORAGE
24 -48 h
ON
UV-A
BLUE
RED
FAR-RED
5 °C
cv 'Elsanta'
Ripening 75%
OFF
7 days


Control
24 h
48 h
0
1
2
3
4
5
6
7
Storage (d)

STORAGE

24 -48 h

UV-A | BLUE | RED | FAR-RED

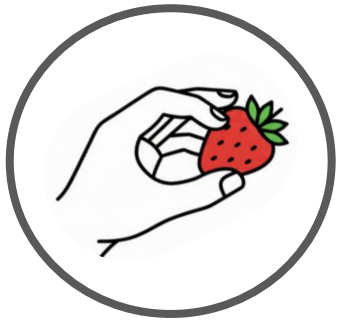


5 °C

cv ‘Elsanta’
Ripening 75%

7 days

WEIGHT LOSS



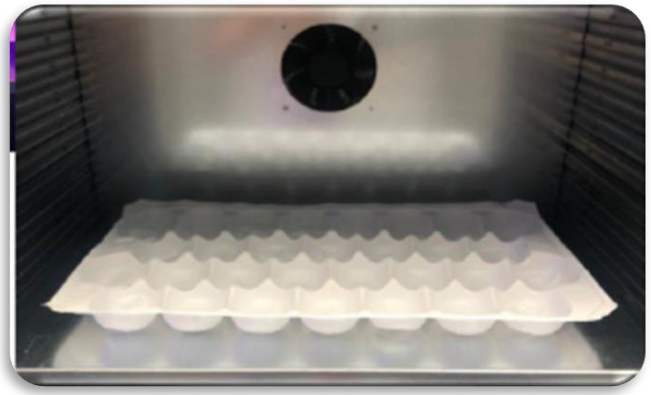
FIRMNESS

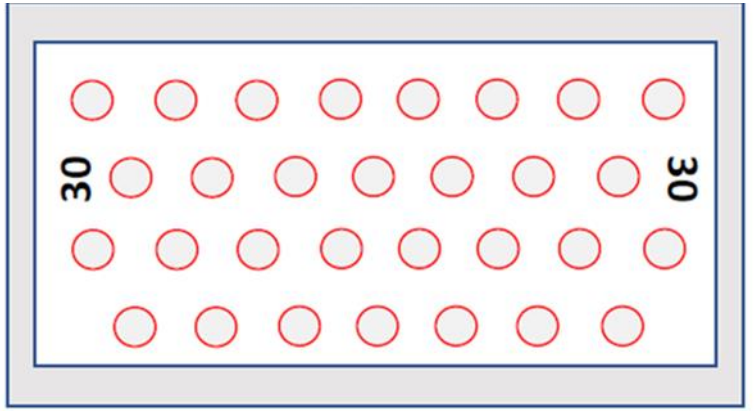
COLOUR

ANTHOCYANINS

SUGAR / ACID

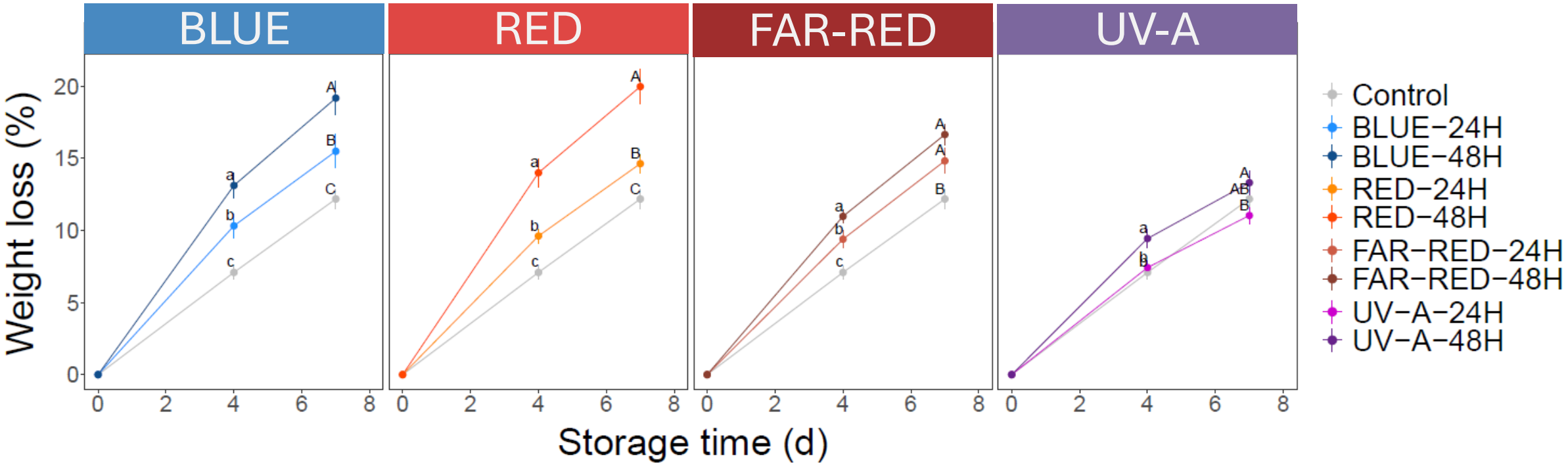
VOCs



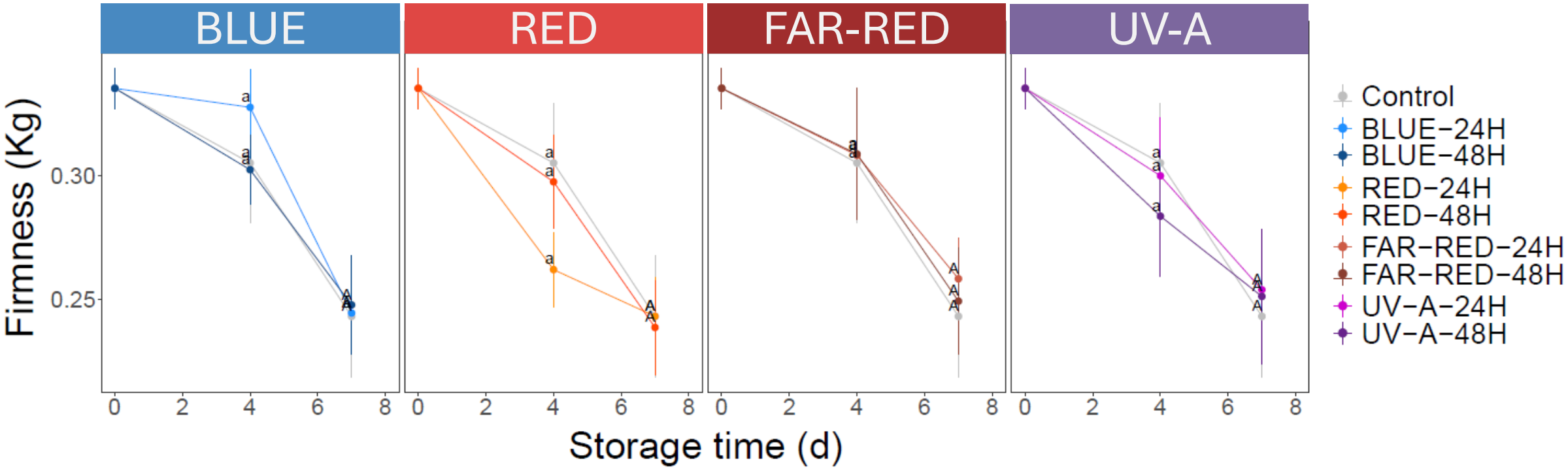


3 rep x 30 fruit x trt

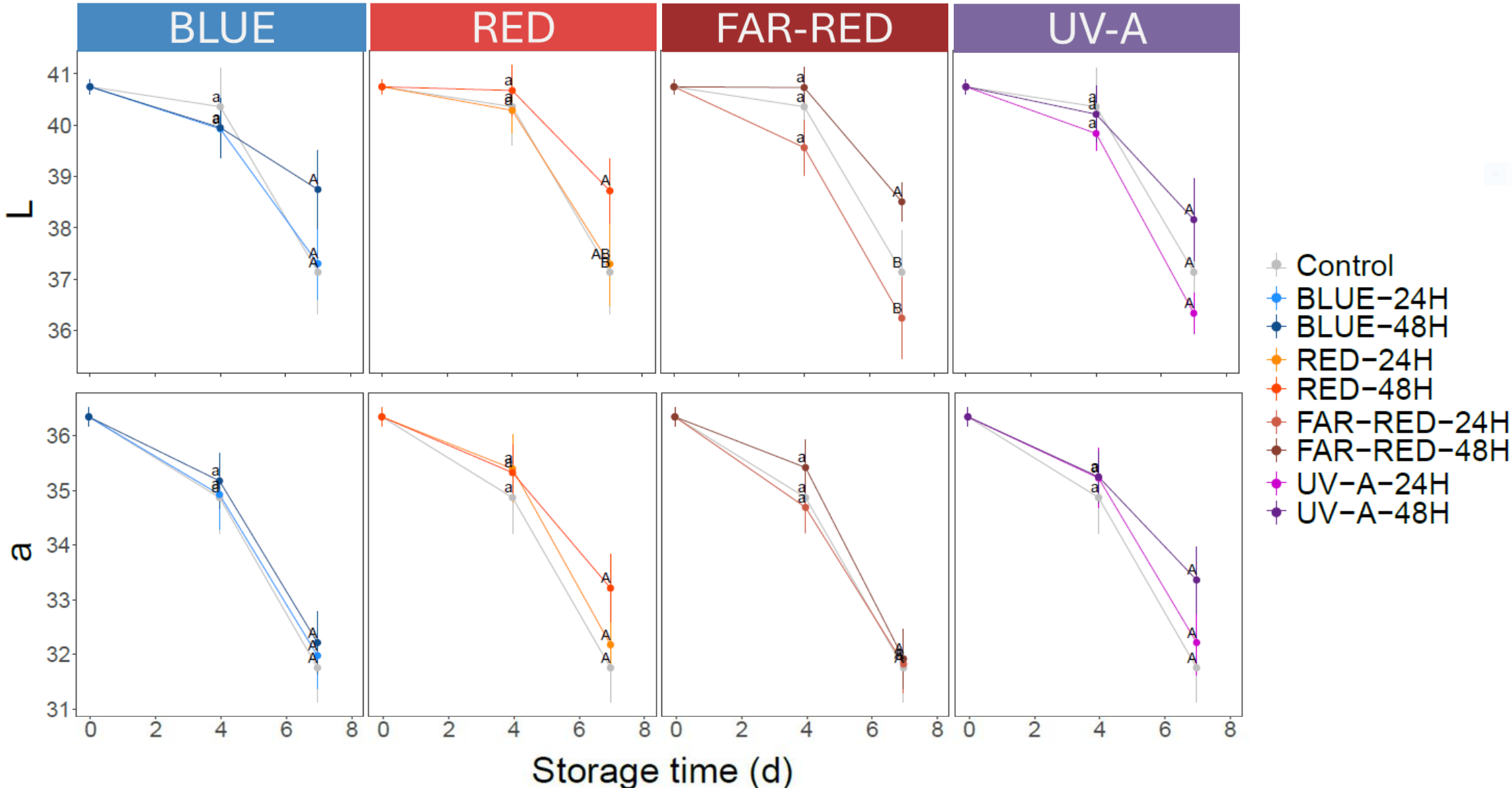
Weight loss (%)


BLUE
RED
FAR-RED
UV-A
Weight loss (%)
Storage time (d)
Control
BLUE−24H
BLUE−48H
RED−24H
RED−48H
FAR−RED−24H
FAR−RED−48H
UV−A−24H
UV−A−48H

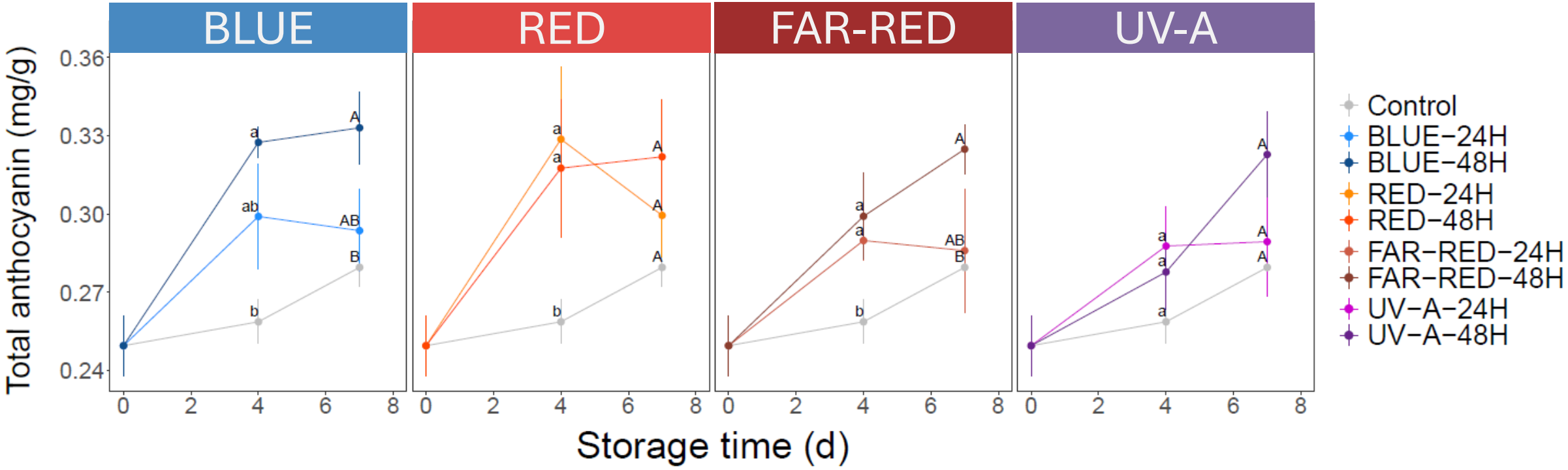
Firmness (Kg)


BLUE
RED
FAR-RED
UV-A
Firmness (Kg)
0.30
0.25
0
2
4
6
8
Storage time (d)
Control
BLUE−24H
BLUE−48H
RED−24H
RED−48H
FAR−RED−24H
FAR−RED−48H
UV−A−24H
UV−A−48H

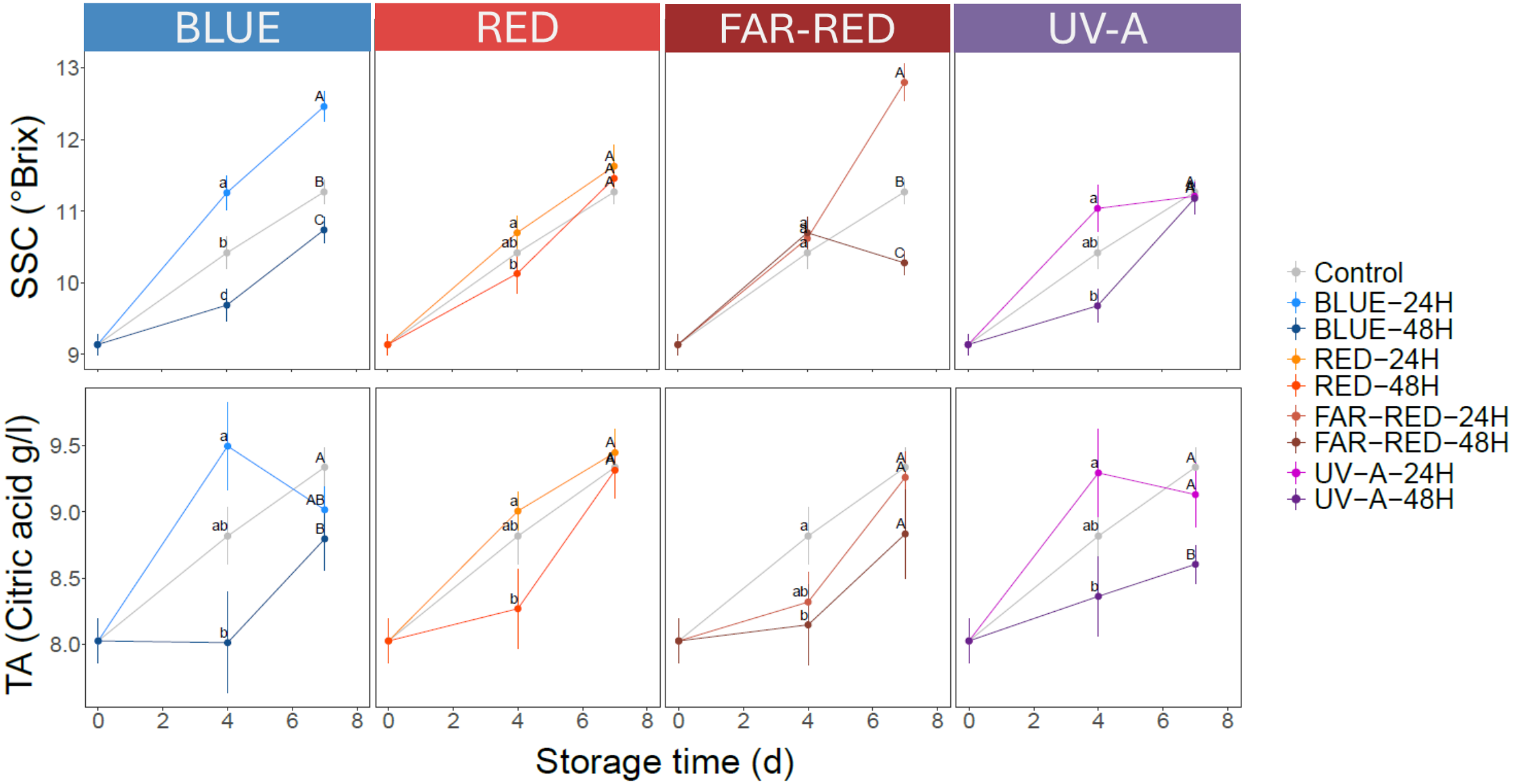
Color (*Lab*)


BLUE
RED
FAR-RED
UV-A
L
a
Storage time (d)
Control
BLUE−24H
BLUE−48H
RED−24H
RED−48H
FAR−RED−24H
FAR−RED−48H
UV−A−24H
UV−A−48H

Total anthocyanin (mg/g)

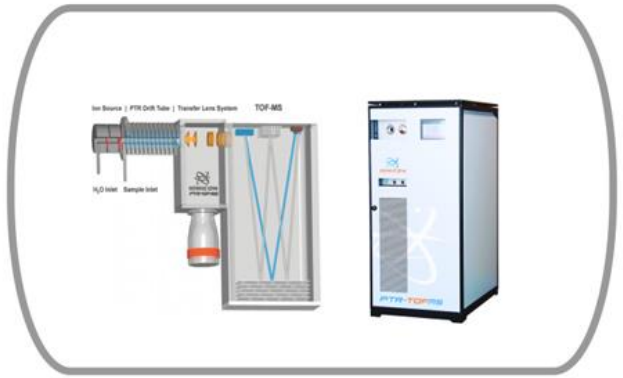


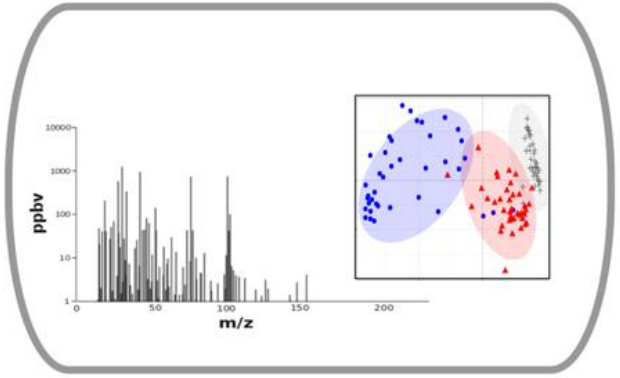
Sugar - Acid


BLUE
RED
FAR-RED
UV-A
SSC (°Brix)
TA (Citric acid g/l)
Storage time (d)
Control
BLUE−24H
BLUE−48H
RED−24H
RED−48H
FAR−RED−24H
FAR−RED−48H
UV−A−24H
UV−A−48H

VOCs

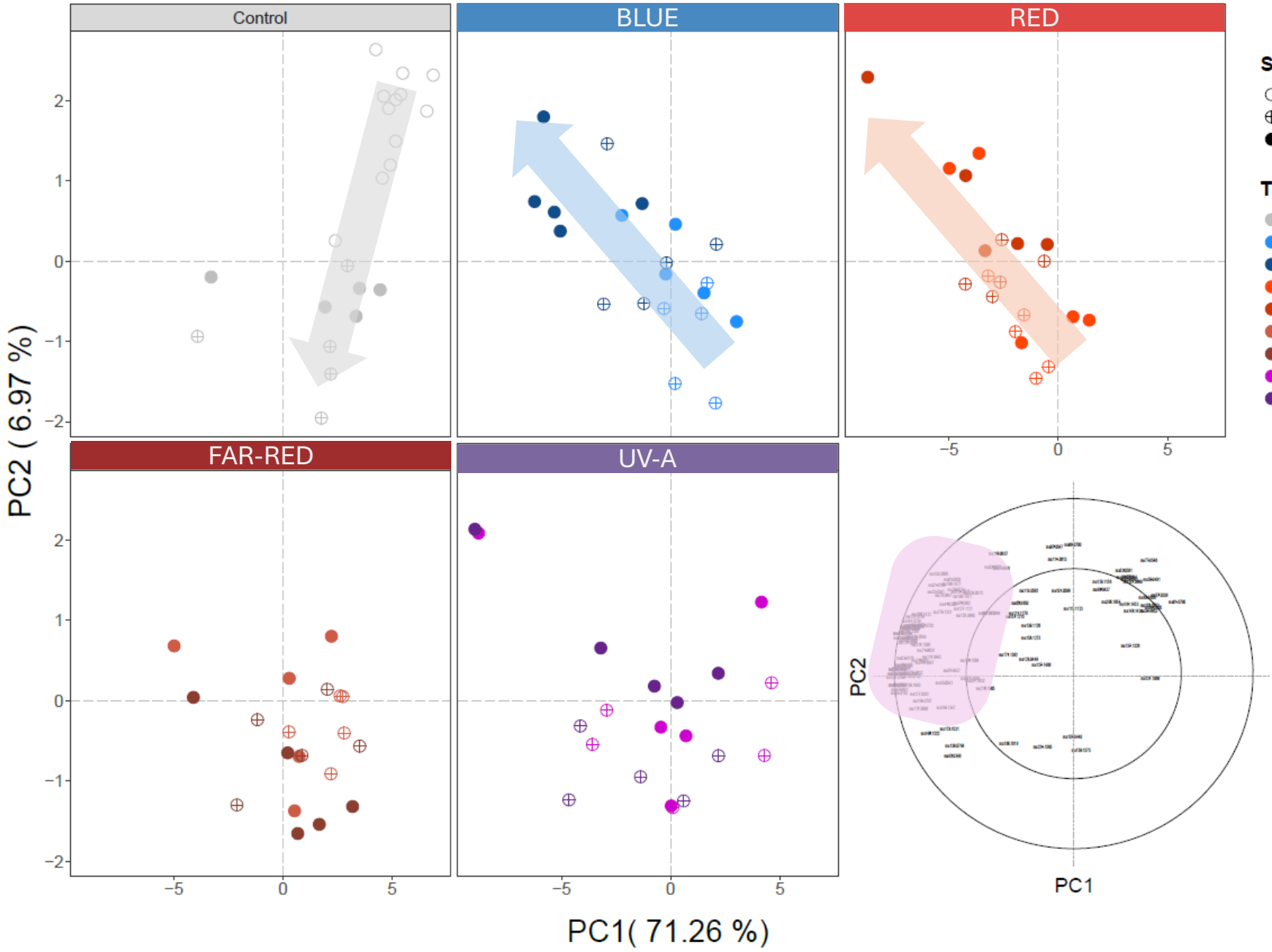
300
samples/day



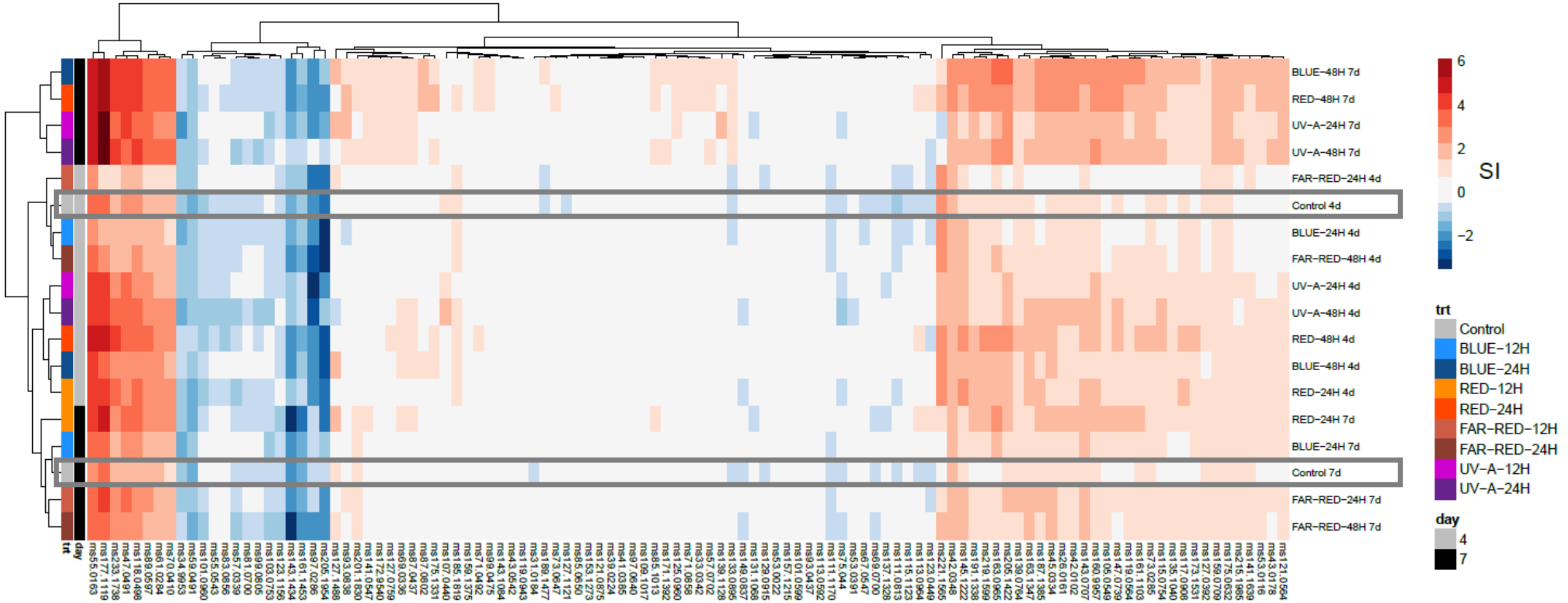


VOCs

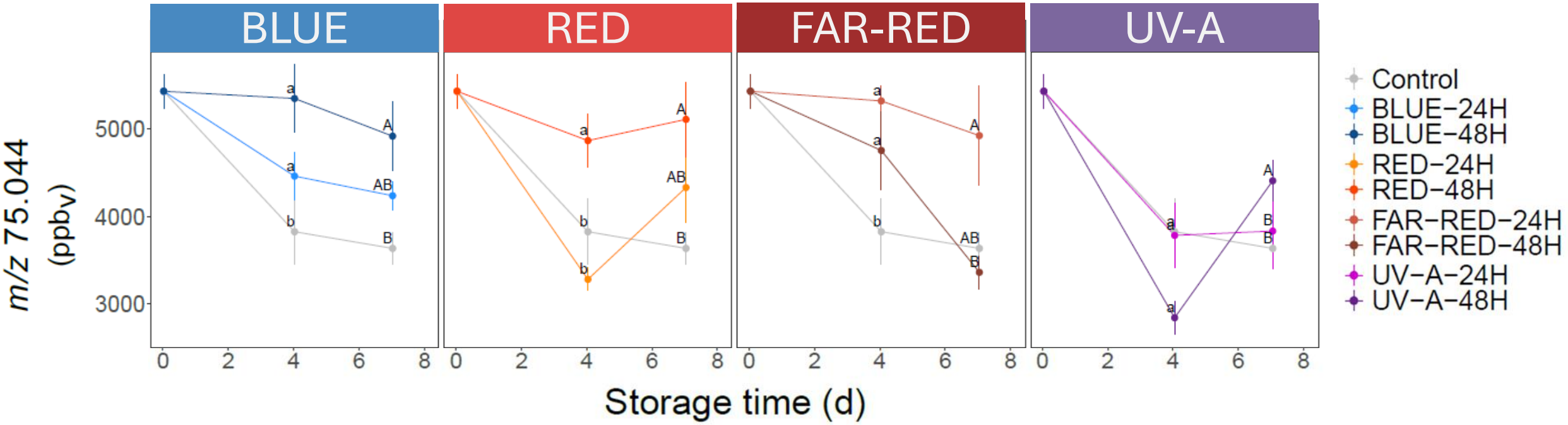

IONICON
PTR-TOF 8000


Control
BLUE
RED
FAR-RED
UV-A
PC2 (6.97 %)
PC1(71.26 %)
Storage (d)
0
4
7
Treatment
Control
BLUE−24H
BLUE−48H
RED−24H
RED−48H
FAR−RED−24H
FAR−RED−48H
UV−A−24H
UV−A−48H
PC2
PC1

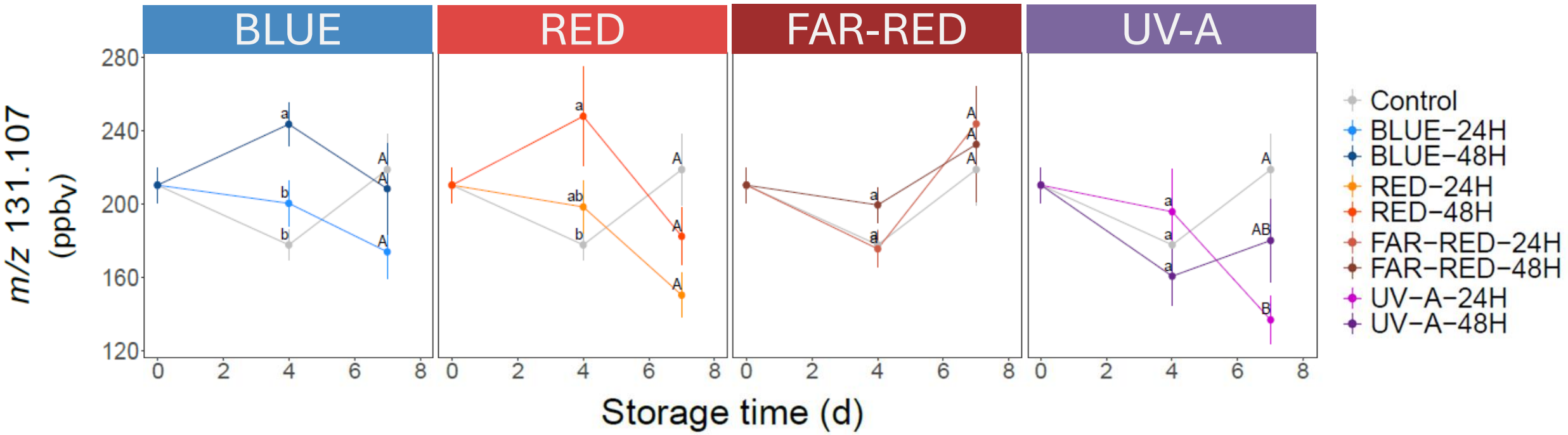
VOCs


BLUE−48H 7d
RED−48H 7d
UV−A−24H 7d
UV−A−48H 7d
FAR−RED−24H 4d
Control 4d
BLUE−24H 4d
FAR−RED−48H 4d
UV−A−24H 4d
UV−A−48H 4d
RED−48H 4d
BLUE−48H 4d
RED−24H 4d
RED−24H 7d
BLUE−24H 7d
Control 7d
FAR−RED−24H 7d
FAR−RED−48H 7d
trt
day
SI
6
4
2
0
−2
trt
Control
BLUE−12H
BLUE−24H
RED−12H
RED−24H
FAR−RED−12H
FAR−RED−24H
UV−A−12H
UV−A−24H
day
4
7

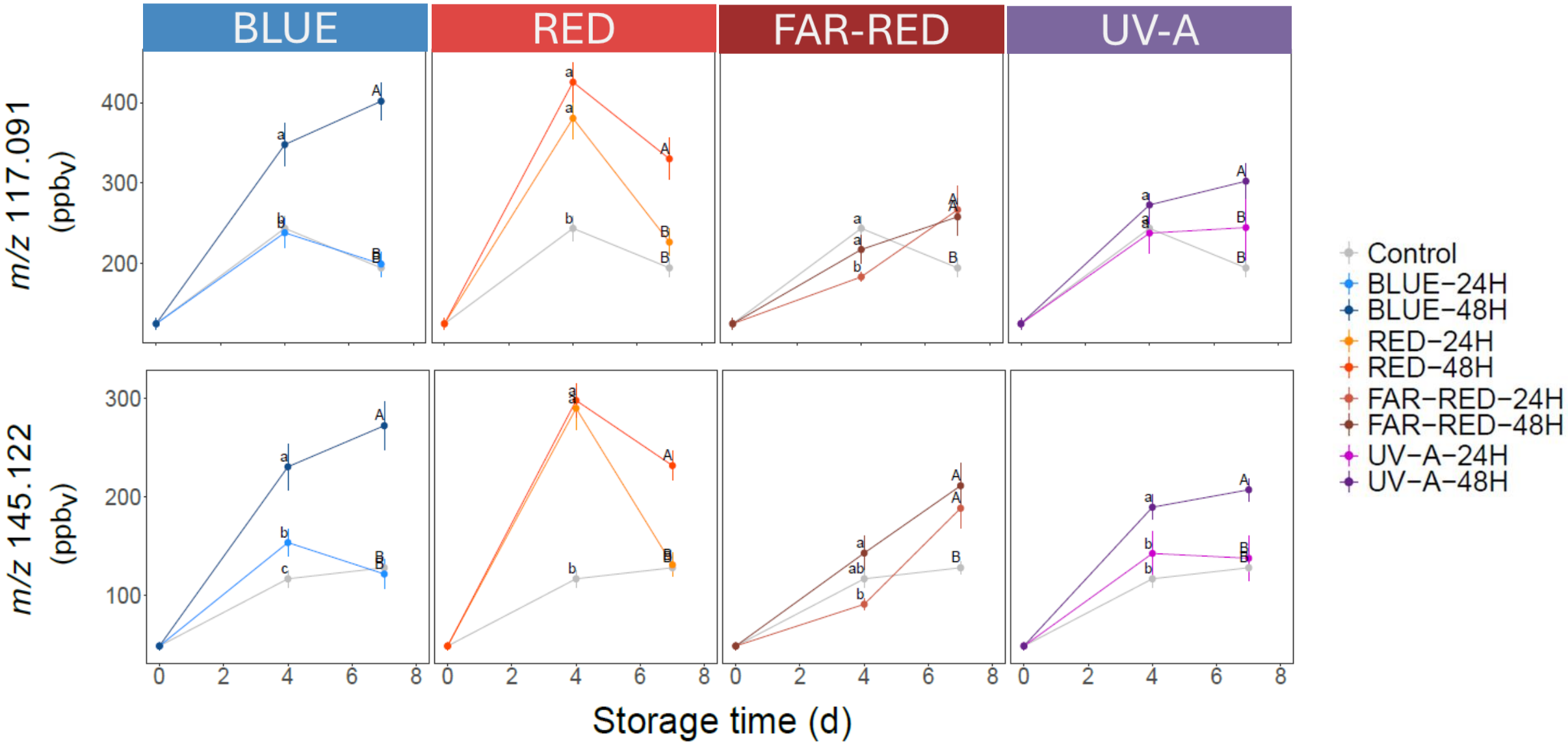
C3 esters (methyl acetate)

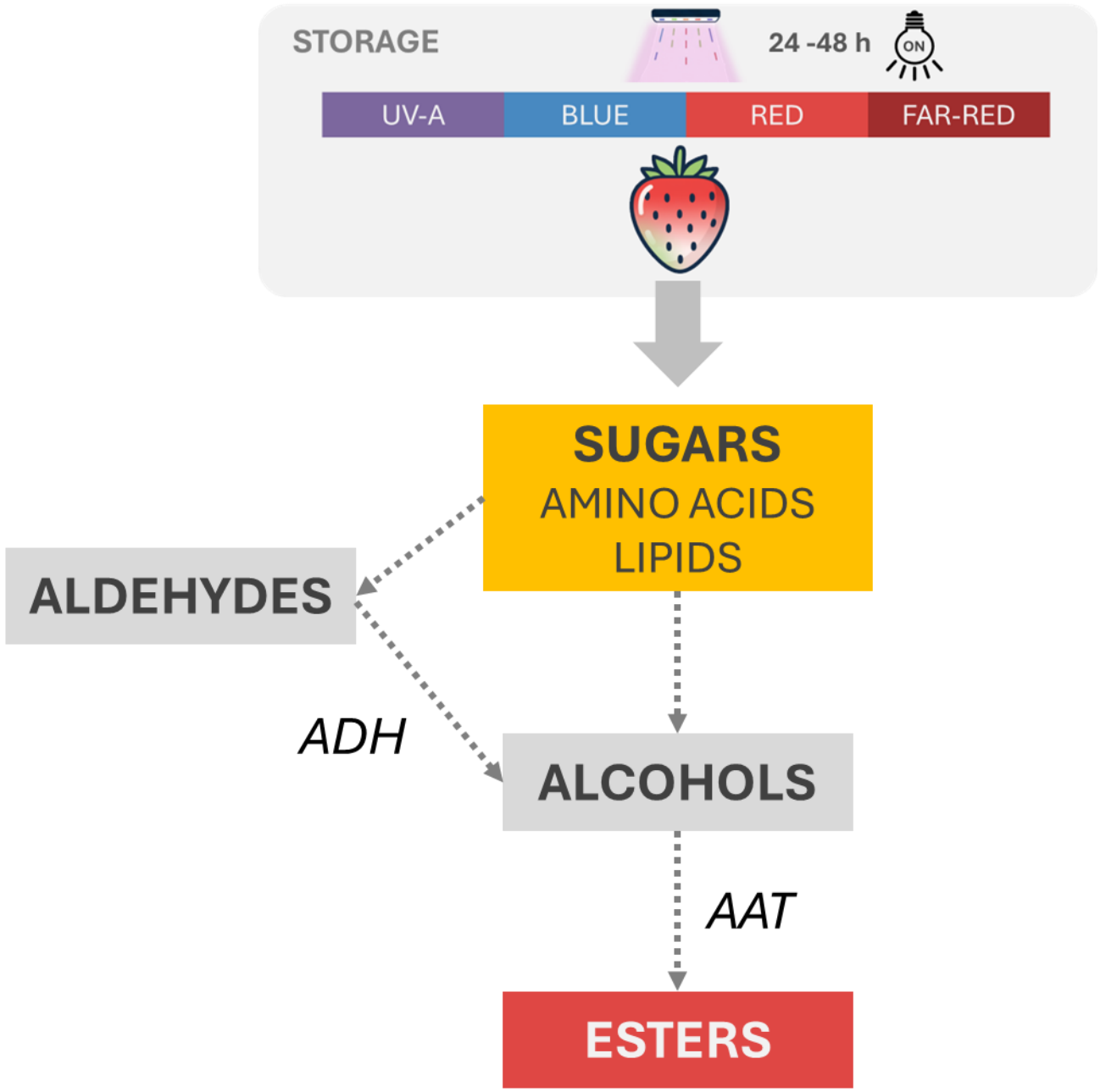


C7 esters (ethyl isovalerate)



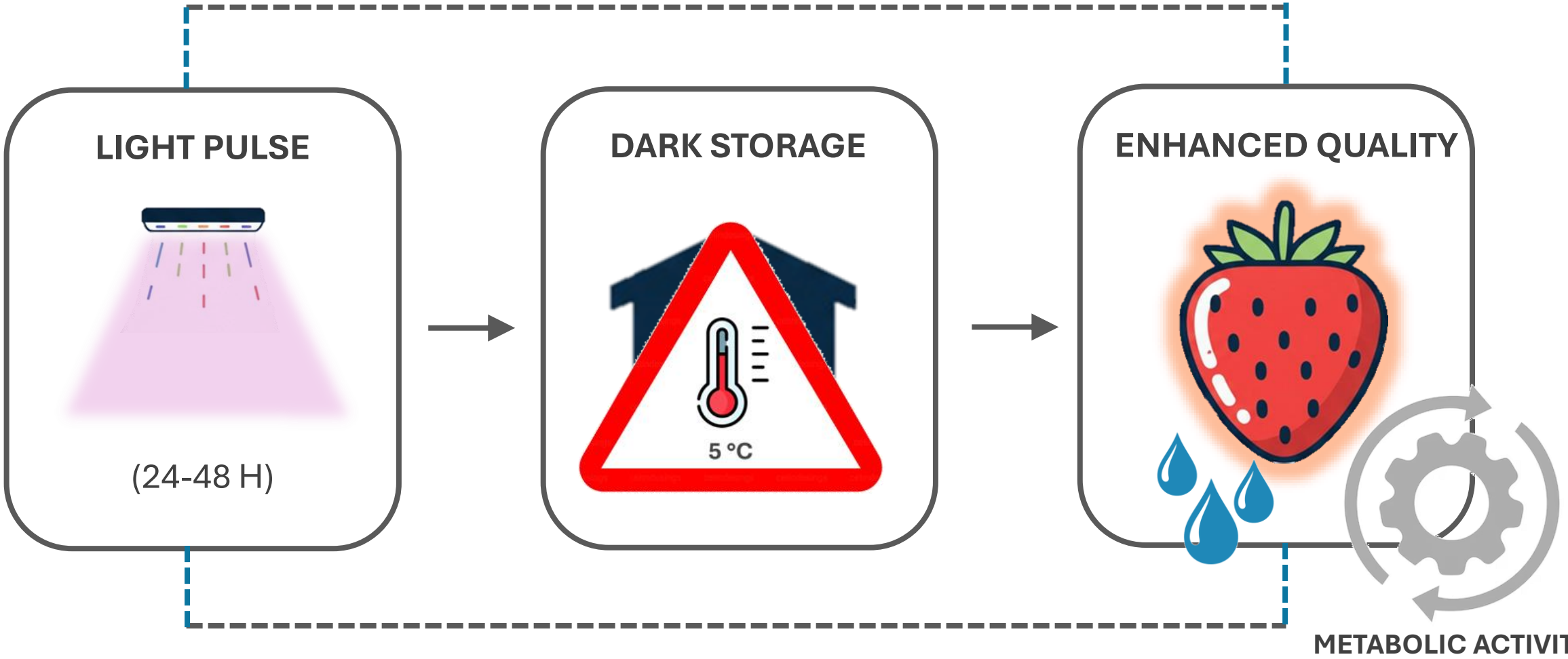
C6 and C8 esters (methyl isovalerate; Isobutyl butyrate)



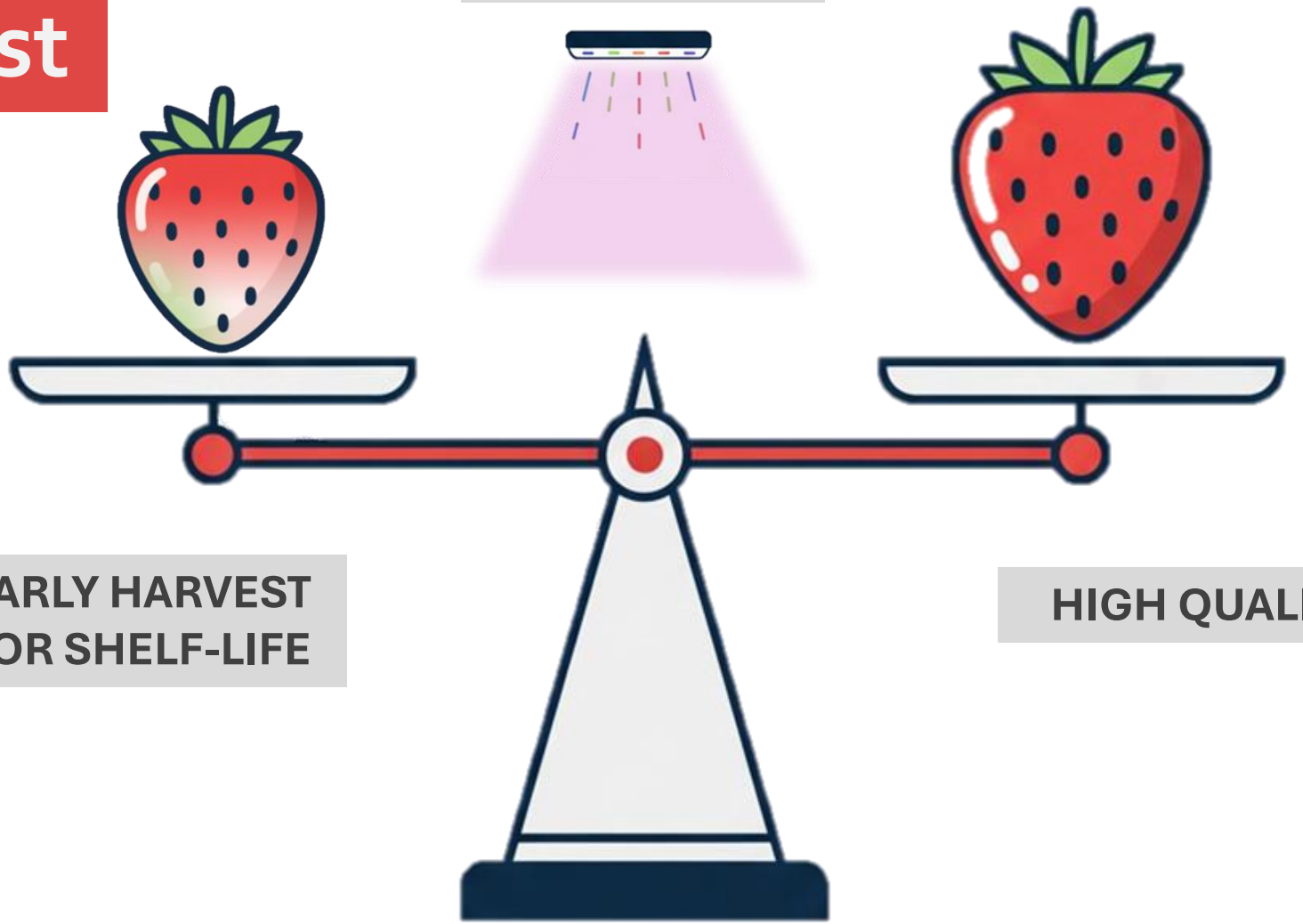


From sugars… to esters

A light pulse has a LASTING effect on quality



From PASSIVE to ACTIVE postharvest

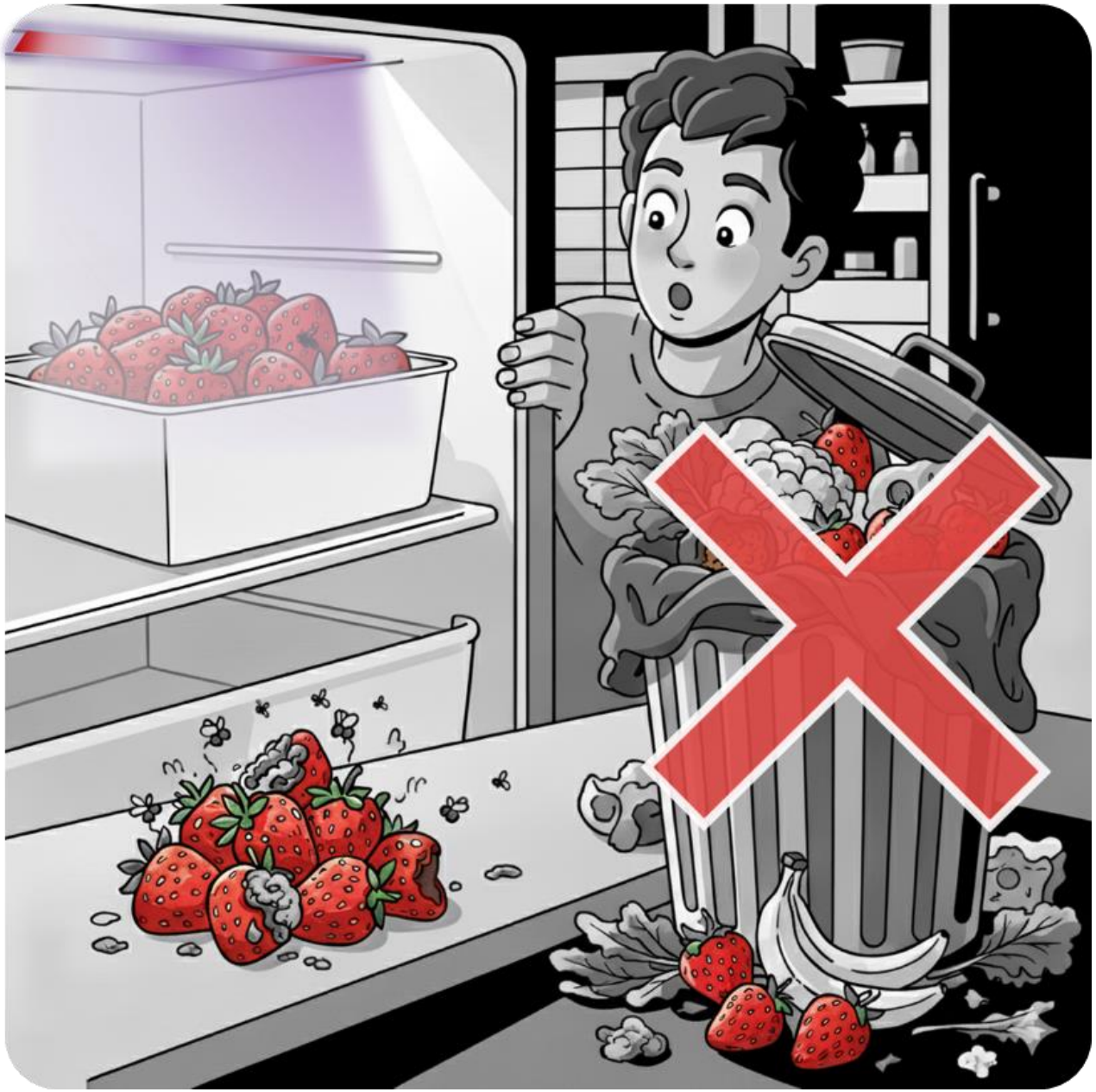


FARM-TO-SHELF optimation with LEDs

ENERGY EFFICIENT

PRECISE CONTROL


WE ARE THE infarmers AND YOUR NEIGHBOURHOOD IS OUR FARM
Full of flavour!
Only at M&S FOOD
GREEK BASIC
£1.50
£1.20

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Full of flavour!
Only at M&S FOOD
GREEK BASIC
£1.50
£1.20

[1]Research and Innovation Centre

FONDAZIONE EDMUND MACH dal 1874

[2]DISTAL – Department of Agricultural and Food Sciences and Technologies

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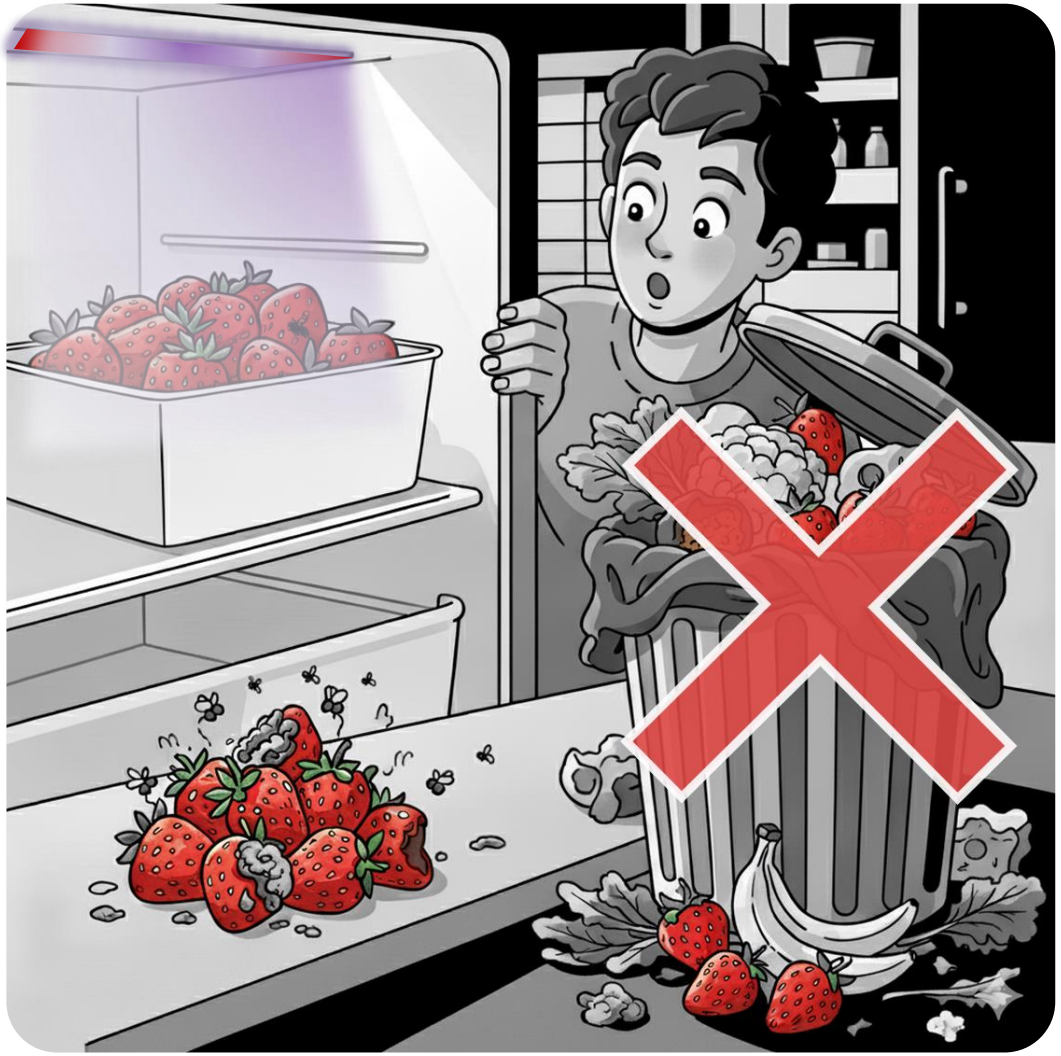
Paucek Ivan[2], Khomenko Iuliia[1], Pennisi Giuseppina[2], Pistillo Alessandro[2], Pastore Chiara[2], Gianquinto Giorgio[2], Biasioli Franco[1], Orsini Francesco[2], Spinelli Francesco[2]



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