

LITERATURE CITED

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Table 1 Threshold concentrations and corresponding descriptors for selected volatile compounds quantified in this study.		
Compound	Threshold (mg/L)^a	Descriptors^a
Acetic acid	175	Unpleasant, spoiled, vinegar
Benzyl alcohol	900	Woody
n-Butanol	150	Solvent-like
Decanoic acid	6.0	Soapy
Diethylsuccinate	65 ^b	Mild ester
Ethylacetate	12.27	Solvent Like
Ethyldecanoate	0.51	Estery, fatty, brandy, oil, grape
Ethyldecanoate	3.5	Fatty
Ethylhexanoate	0.08	Estery, wine like
2-Ethylhexanol	1.0	Slightly fruity
Ethyllactate	150	Fruity, Floral, enhances mouthfeel
Ethyloctanoate	0.58	Estery, pineapple, fruity
Isoamylacetate	0.18	Estery, banana
2-Methylpropanol	75	Slightly Apple like
3-Methylbutanol	7.0	Warm, herbaceous, nut like, penetrating, acrid at high levels
Hexanoic acid	8.0	Acidic
n-Hexanol	1.08	Green, grassy, fruity, medicinal
cis-3-Hexenol	13	Grassy green odor
Hexylacetate	0.67	Grassy, newly cut hay, crushed vegetable matter, sweet
Isoamylactanoate	---	Fruity
Octanoic acid	10	Fruity, Floral
Phenethylacetate	1.80	Floral, violet
2-Phenylethanol	7.5	Rose odor

^a values selected from the literature; see Meilgaard (1975), Simpson and Miller (1984a) and Etievant (1991) and references cited therein.

^b M. Meilgaard, 2003, personal communication

Table 2

Results of four vintages of chemical analyses^a for control and capture and return (return) Chardonnay (*Vitis vinifera* L.) wines fermented in commercial wineries.

Vintage-Vineyard	pH			TA (mg/L)			EtOH (% v/v)		
	Control	Return	Sig ^b	Control	Return	Sig ^b	Control	Return	Sig ^b
1998-West	3.57	3.60	NS	5.20	5.46	*	12.10	12.30	*
1999- C96	3.72	3.70	NS	5.80	5.92	*	12.70	12.50	NS
1999- Front	3.59	3.60	NS	5.89	6.07	*	12.50	12.70	*
1999-North	3.72	3.75	NS	5.86	6.12	*	12.20	12.50	*
2000-Front	3.60	3.60	NS	5.80	6.10	*	12.10	12.00	NS
2000-West	3.50	3.50	NS	6.20	5.90	*	12.10	12.30	*
2000	3.87	3.77	*	4.68	5.04	*	11.70	12.10	*
2002	3.60	3.60	NS	6.40	6.00	*	13.10	13.30	*

^a Mean values (n=6).

^b Significance determined using analysis of variance; NS- not significantly different, * - Significant p < 0.05

Table 3

Chemical analysis^a for control, capture and return (return) and capture and remove (remove) Chardonnay (*Vitis vinifera* L.) wines fermented at two temperatures.

Treatment	pH			TA (mg/L)			EtOH (% v/v)		
	15°C	30°C	Sig ^b	15°C	30°C	Sig ^b	15°C	30°C	Sig ^b
Control	3.53	3.53	NS	6.67	6.87	*	12.50	12.30	*
Return	3.49	3.53	*	6.73	6.93	*	12.70	12.50	*
Remove	3.49	3.50	NS	6.71	6.94	*	12.70	12.50	*

^a Mean values (n=6),

^b Significance determined using analysis of variance; NS- not significantly different, * - Significant p < 0.05

Table 4

Effects of treatment (capture and return) on average aroma units (AU) of volatile compounds found to be significantly different^b in Chardonnay (*Vitis vinifera* L.) wines fermented commercially from 1998 to 2002.

Vintage	Compound	AU Control	AU Treatment
1998 West	Diethylsuccinate	NQ ^c	NQ ^c
	Ethyldecanoate	0.6	1.2
	Ethyldecanoate	NQ ^c	NQ ^c
	Ethylhexanoate	11.2	11.4
	Ethylacetate	NQ ^c	NQ ^c
	Hexylacetate	0.10	0.4
	3-methylbutanol	34.1	26.4
1999 C96	Diethylsuccinate	0.01	0.03
	Ethylacetate	7.3	21.3
	Hexylacetate	0.3	0.00
	Isoamylacetate	15.0	4.0
	Phenethylacetate	NQ ^c	NQ ^c
1999 North	Decanoic acid	0.8	0.6
	Diethylsuccinate	0.01	0.01
	Ethylacetate	9.7	11.6
	Ethyldecanoate	1.0	1.4
	Ethyldecanoate	0.2	0.1
1999 Front	Diethylsuccinate	0.00	0.01
	Phenethylacetate	NQ ^c	NQ ^c
2000 Front	Diethylsuccinate	0.02	0.01
	n-Hexanol	1.9	2.6
	Hexylacetate	0.2	0.01
	Isoamylacetate	15.6	9.7
	2-Methylpropanol	0.2	0.3
	Phenethylacetate	0.08	0.03
	2-Phenylethanol	1.6	1.2
2000 West	Diethylsuccinate	0.01	0.02
2002	Acetic acid	1.8	0.8
	Ethylhexanoate	11.1	9.2
	Ethyldecanoate	1.8	1.4
	Hexylacetate	0.7	0.6
	3-Methylbutanol	24.2	21.0
	Octanoic acid	0.8	0.7

^a Sensory thresholds in mg/L referenced in Table 1. AU values greater than 1.0 indicate that the compound is present in concentrations above threshold. AU value <1 indicates the compound is an aroma contributor.

^b significantly different $p < 0.05$

^c NQ- not quantified. Significance determined based on peak area ratio.

Table 5

Aroma units^{*} (AU) of volatile compounds found to be significantly different^{a,b} between control, capture and return (return) and capture and remove (remove) in Chardonnay (*Vitis vinifera* L.) wines in 2002.

Compound	AU		
	Control	Return	Remove
Acetic acid	1.8 ^a	0.8 ^b	1.1 ^b
Decanoic acid	0.4 ^a	0.4 ^a	0.3 ^b
Diethylsuccinate	0.01 ^a	0.01 ^a	0.02 ^b
Ethylhexanoate	11.1 ^a	9.2 ^b	7.7 ^b
Ethyloctanoate	1.8 ^a	1.4 ^b	1.3 ^b
n-Hexanol	1.1 ^a	1.0 ^a	0.9 ^b
Hexylacetate	0.7 ^a	0.6 ^b	0.6 ^b
3-Methylbutanol	24.2 ^a	21.0 ^b	19.7 ^b
Octanoic acid	0.8 ^a	0.6 ^b	0.6 ^b

* Sensory thresholds in mg/L referenced in Table 1. AU values greater than 1.0 indicate that the compound is present in concentrations above threshold. AU value <1 indicates the compound is an aroma contributor.

^{a,b} Denotes a significant difference between treatments p<0.05

Table 6

Aroma units (AU) of volatile organic compounds identified in trap condensate collected from commercial fermentations of Chardonnay (*Vitis vinifera* L.) in 2002.

Compound	AU ^a
Acetic acid	0.53
Decanoic acid	0.88
Diethylsuccinate	0.01
Ethylacetate	5.23
Ethyldecanoate	0.74
Ethyldecanoate	0.05
Ethylhexanoate	7.63
Ethyloctanoate	1.80
Hexanoic acid	0.17
n-Hexanol	1.31
Isoamylacetate	31.69
3-Methylbutanol	18.22
Octanoic acid	0.89
Phenethylacetate	0.14
2-Phenylethanol	0.83

^aAroma unit values greater than 1.0 indicate that the compound is present in concentrations above sensory threshold. AU values < 1.0 indicates the compound may be an aroma contributor.

Table 7

Aroma units^a (AU) of compounds found to be significantly different^b in Chardonnay (*Vitis vinifera* L.) wines fermented in a small scale laboratory setting, at two different temperatures.

Compound	Control (AU)			Return (AU)			Remove (AU)		
	15°C	30°C	Sig	15°C	30°C	Sig	15°C	30°C	Sig
Acetic acid	0.04	0.07	*	0.06	0.05	NS	0.06	0.08	*
Decanoic acid	0.36	0.51	*	0.57	0.53	NS	0.39	0.39	NS
Ethyldecanoate	0.81	1.50	*	0.57	0.96	*	0.87	0.84	NS
Ethyldecanoate	0.04	0.11	*	0.03	0.05	NS	0.03	0.09	*
Ethylhexanoate	4.00	2.82	*	4.73	3.78	*	7.49	6.98	*
Ethylhexanoate	1.29	1.04	*	0.98	0.92	NS	2.08	1.93	*
n-Hexanol	0.77	0.55	*	0.84	0.66	NS	0.85	0.73	NS
Isoamylacetate	37.72	26.01	*	39.05	40.20	NS	51.93	50.45	NS
Octanoic acid	0.47	0.62	*	0.55	0.63	*	0.63	0.71	*
Phenethylacetate	0.17	0.35	*	0.16	0.49	*	0.18	0.19	NS

^aAroma unit values greater than 1.0 indicate that the compound is present in concentrations above threshold. AU values < 1.0 indicates the compound may be an aroma contributor.

^b * indicates significantly different p<0.05, ns- not significantly different

Table 8

Triangle difference testing of control and capture and return Chardonnay (*Vitis vinifera* L.) wines fermented commercially over four vintages, evaluated by a consumer panel.

Vintage	Total N	Correct	N Needed	Significance ^a
1998 West	18	11	10	Yes
1998 C96	13	9	8	Yes
1999 C96	30	13	15	No
1999 Front	30	11	15	No
1999 North	18	13	10	Yes
2000 WH	42	17	20	No
2002	40	16	19	No

^a $\alpha = 0.05$, $\beta = 0.01$

Table 9

Triangle difference testing of control, capture and return (Return) and capture and remove (Remove) Chardonnay (*Vitis vinifera* L.) wines fermented on a small scale in a laboratory setting at two temperatures evaluated by a consumer panel.

Treatment	Comparison	Total N	Correct	N Needed	Significance ^a
15°C	Control v Return	48	22	22	Yes
	Control v Remove	42	13	20	No
	Return v Remove	45	15	21	No
30°C	Control v Return	48	15	22	No
	Control v Remove	42	10	20	No
	Return v Remove	45	13	21	No
Control	15°C v 30°C	42	23	20	Yes
Return	15°C v 30°C	42	21	20	Yes
Remove	15°C v 30°C	45	25	21	Yes

^a $\alpha = 0.05$, $\beta = 0.01$

Figure 1

Fermentation rate of Chardonnay (*Vitis vinifera* L.) fermented at 15°C and 30°C for control, capture and return (return) and capture and remove (remove) wines fermented on a small scale in a laboratory setting.

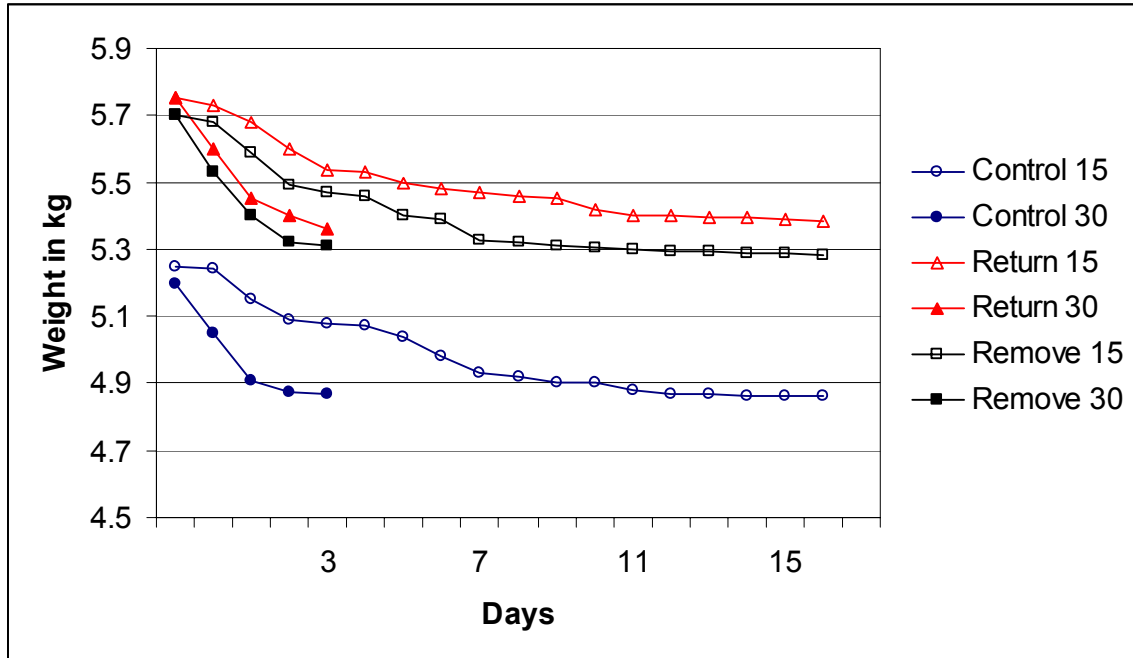
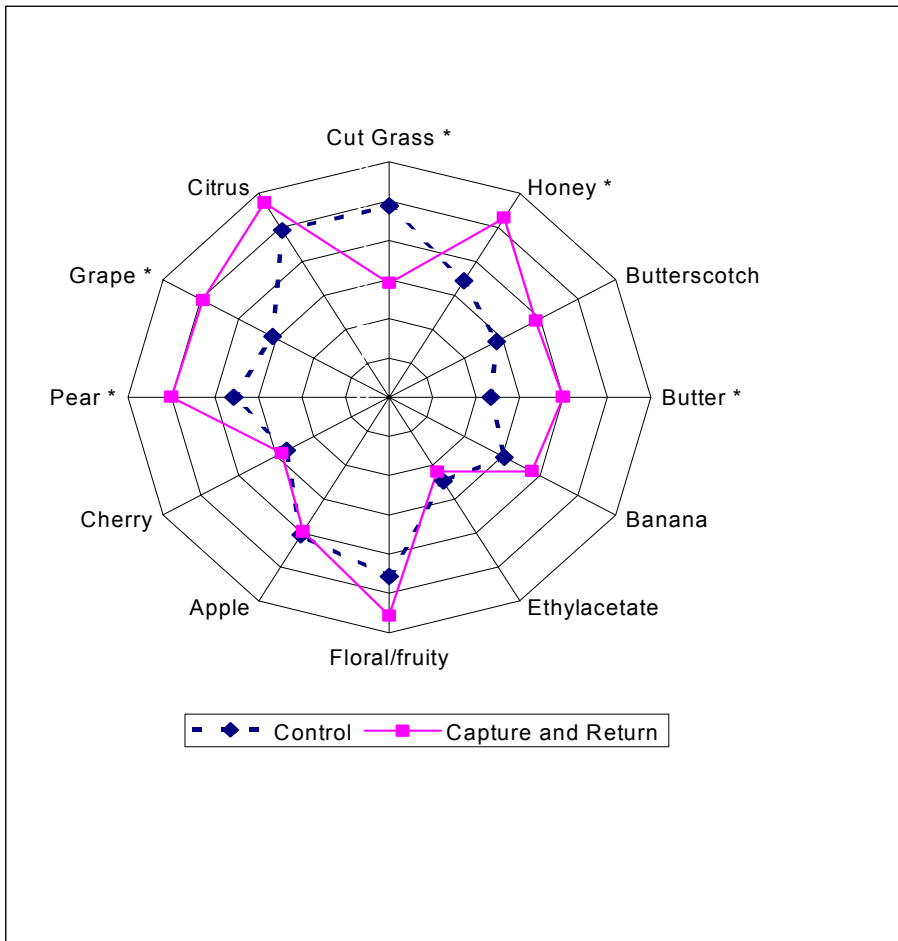


Figure 2 Aroma profile of Chardonnay wine (*Vitis vinifera* L.) produced in 1998.
 Aroma profile of Chardonnay (*Vitis vinifera* L.) wines determined by a panel of experts (n=8)



* Means determined to be significantly different at $\alpha = 0.05$

Emily Hodson

1825 Clay Hill Road, Charlottesville, VA. 22901
(434)/531-7754; email: veritascellar@aol.com

WORK EXPERIENCE

Saddleback Farm, Winery Vineyards & Stables

Afton, VA

General Manager

August 1999- Present

As general manager of Saddleback Farm I am responsible for all aspects of setting up new vineyards, and management and care of existing vineyards. I am currently responsible for information gathering and planning of winery design as well as accounts payable, payroll and all other general business matters.

Save the Children

Siraha, Nepal

Research Assistant- Practicum

May 1999- September 1999

Worked for Save the Children to implement and evaluate their 'Community Defined Quality' Health Care Program. Activities included preparation for, and facilitation of focus group discussions as well as research design to test the feasibility and effectiveness of the CDQ methodology.

Carter Center-Global 2000

Atlanta, GA

Graduate Assistant

January 1998- May 1999

Worked with the Carter Center to implement HIV/AIDS awareness programs via agricultural extension agents in Africa. My responsibilities included research, grant writing and fieldwork.

The Rodman Lab, Department of Visual Science, Emory University

Atlanta, GA

Lab Technician

January 1998-December 1998

Responsible for all logistical aspects of coordinating and running an effective immunohistochemistry lab. Organized time schedules, processed orders and deliveries, conducted training of all new research assistants.

The Rodman Lab, Department of Visual Science, Emory University

Atlanta, GA

Research Assistant

January 1996-December 1998

Assisted Dr. Hillary Rodman in architectonic division of the visual cortex of *Spermophilus tridecimlineatus*. Received the Howard Hughes Grant for Undergraduate Research to continue my own studies, which has culminated in a published abstract and presentation at the Society for Neuroscience.

EDUCATION

Emory University, Rollins School of Public Health

Atlanta, GA

Masters of Public Health Student, Department of International Health pursuing infectious disease concentration. Non-Degree Seeking.

Emory University

Atlanta, GA

B.S., Neuroscience and Behavioral Biology major. Class of 1998
Academic Honors: Dean's List, Phi Delta Epsilon.

EXTRACURRICULAR AND COMMUNITY ACTIVITIES

Rockfish Valley Volunteer Fire Department

1999- Present

Certified On-call Emergency Medical Technician.

Registered Black Angus Herd

1999- Present

UCDavis Extension Long Distance Learning Programs

2000- 2002

VEN 101- Introduction to Winemaking

VEN 124- Wine Production

SKILLS

Certified EMT, Certified in Red Cross Standard First Aid and CPR. Proficiency in statistical computer applications including Epi-Info and SAS. Strong background in advanced sciences with concentrations in Infectious Disease and Neuroscience.