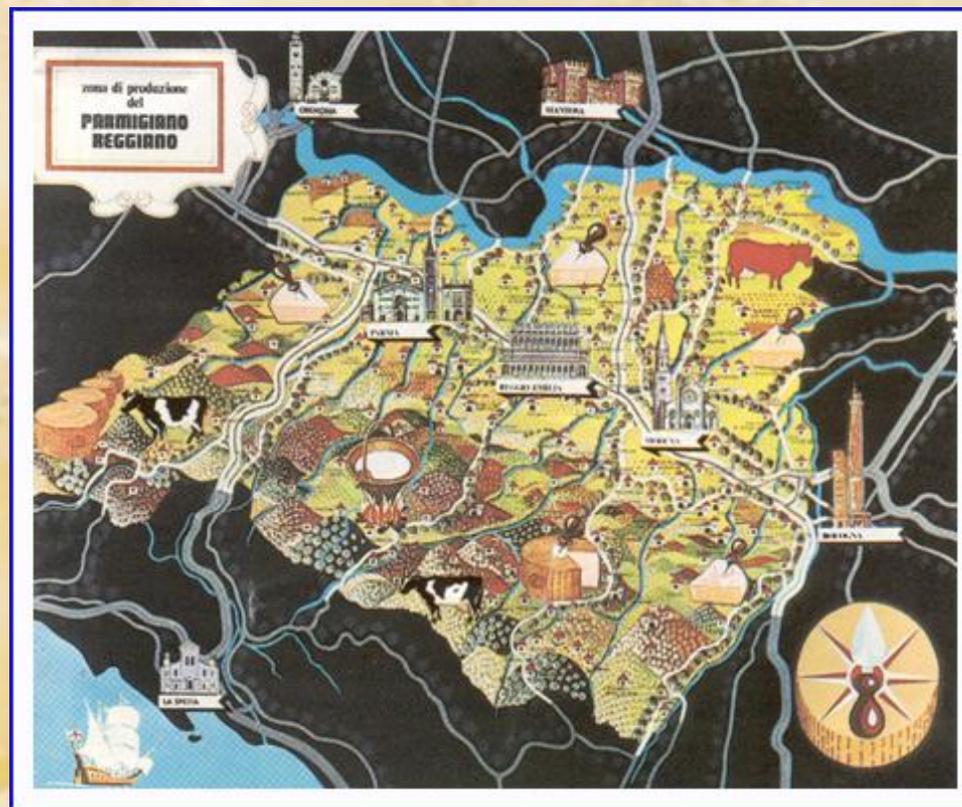
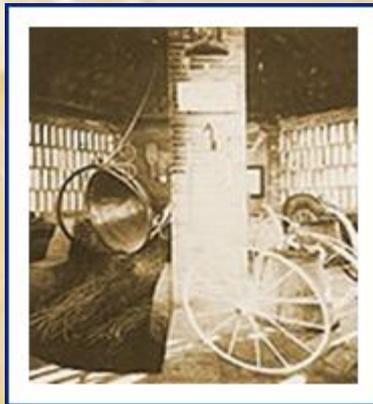


Il Parmigiano-Reggiano



Storia



Razze bovine



Rossa reggiana



Frisona, pezzata nera



Bianca modenese



Bruna alpina



Montanara

Alimentazione bovina

Almeno il 35% della sostanza secca deve essere di produzione aziendale
Almeno il 75% della sostanza secca deve provenire dal Comprensorio.

Sono proibiti:

Insilati di ogni tipo, compresi i pastoni

Foraggi riscaldati per fermentazione;

Foraggi trattati con additivi;

Foraggi ammuffiti, infestati da parassiti, deteriorati,
contaminati da sostanze tossiche,
radioattive o nocive;

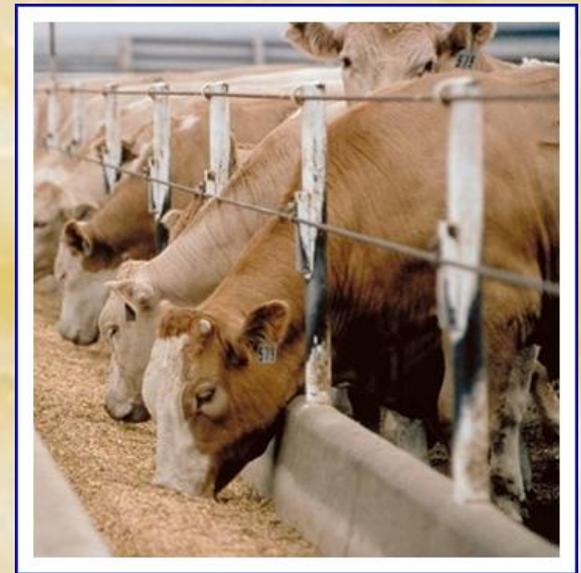
Sottoprodotti della macellazione;

Sottoprodotti dell'industria casearia;

Ortaggi e frutta;

Sottoprodotti dell'industria enologica e saccarifera;

Sottoprodotti provenienti dalla produzione della birra.



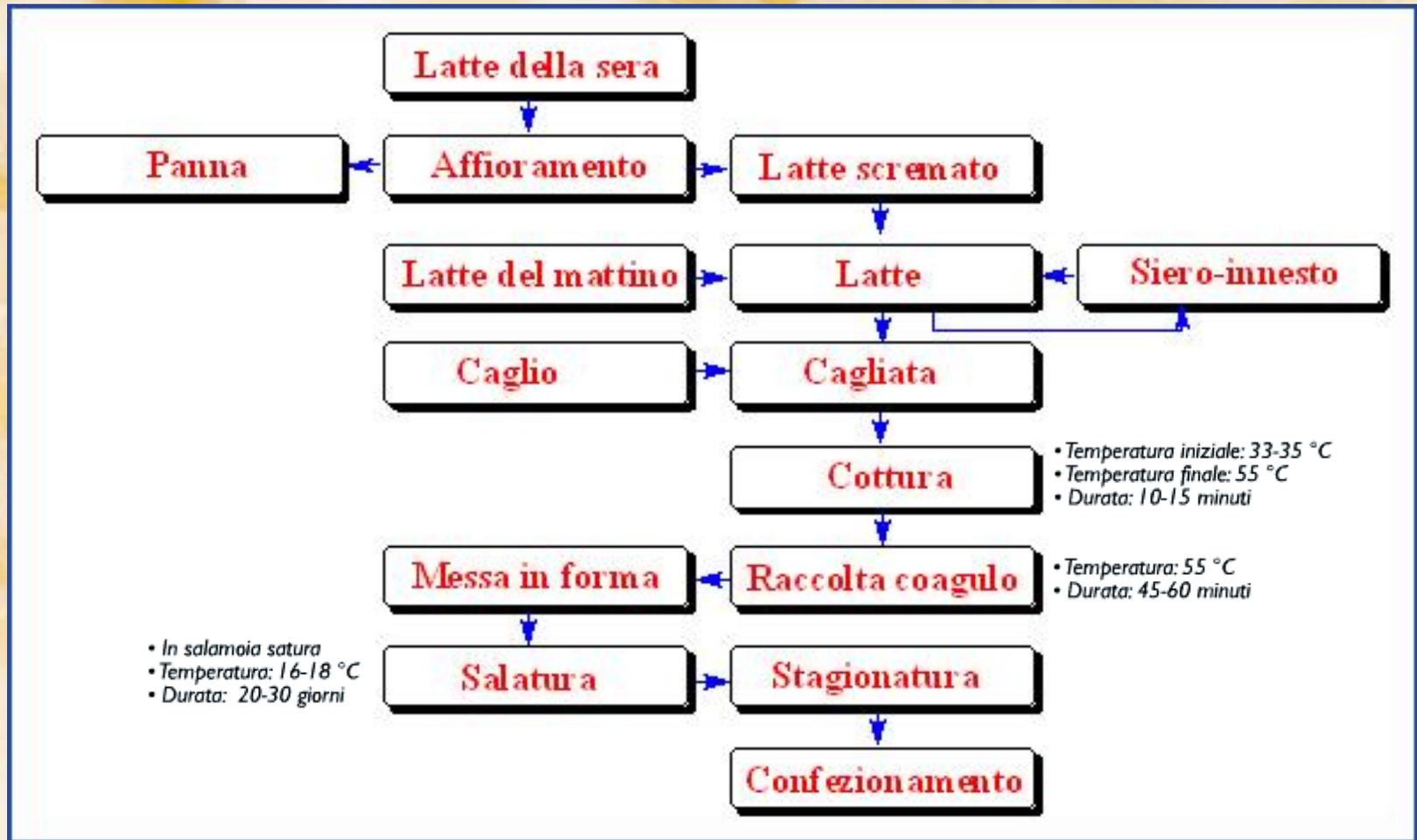
Lavorazione



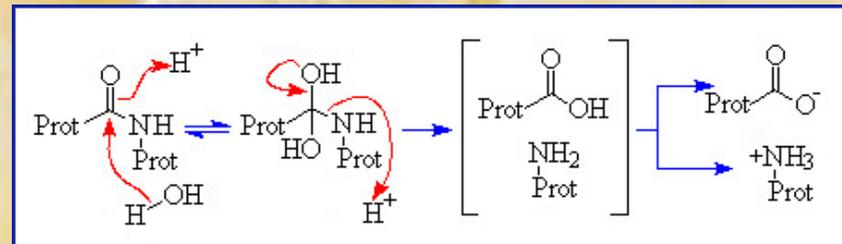
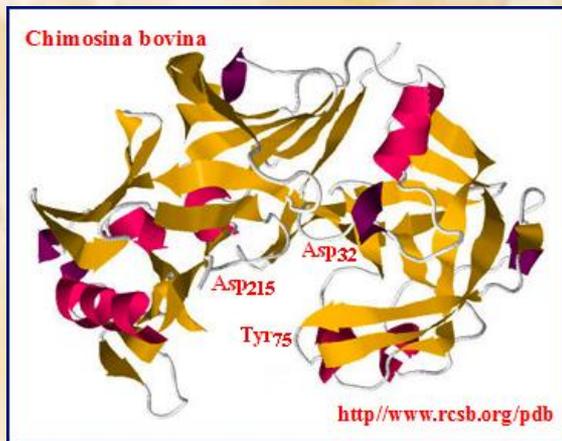
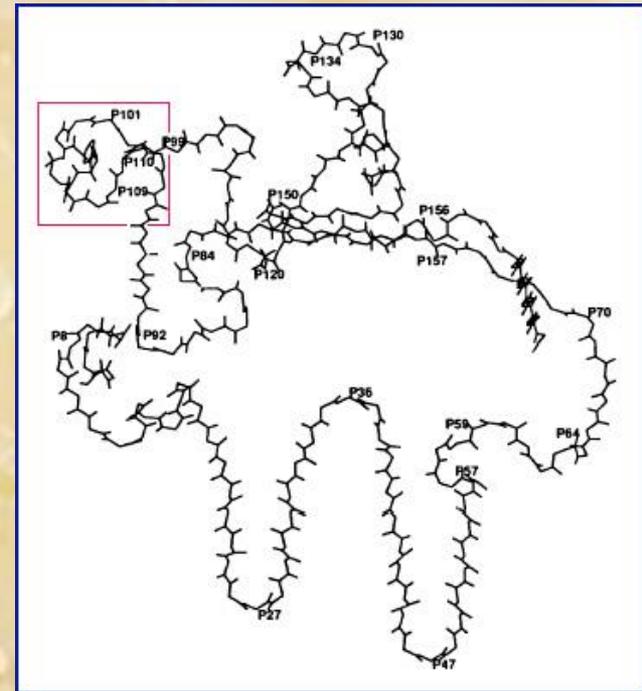
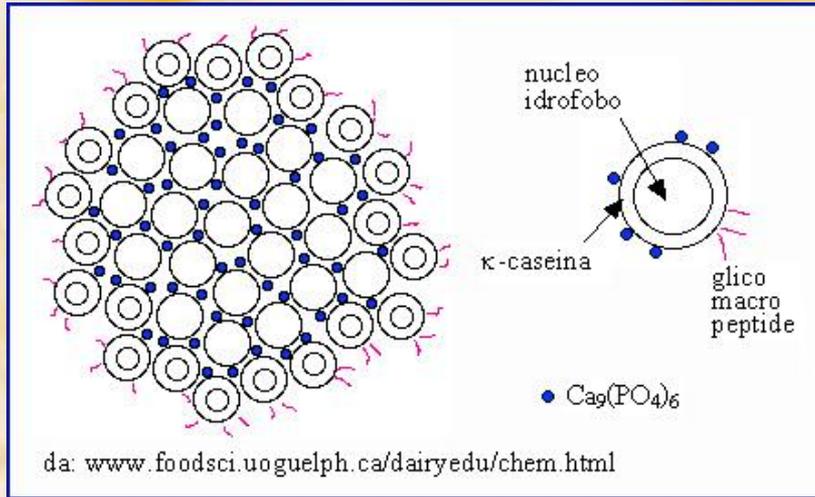
Non sono stabiliti limiti fissi ma intervalli di temperatura e di tempo



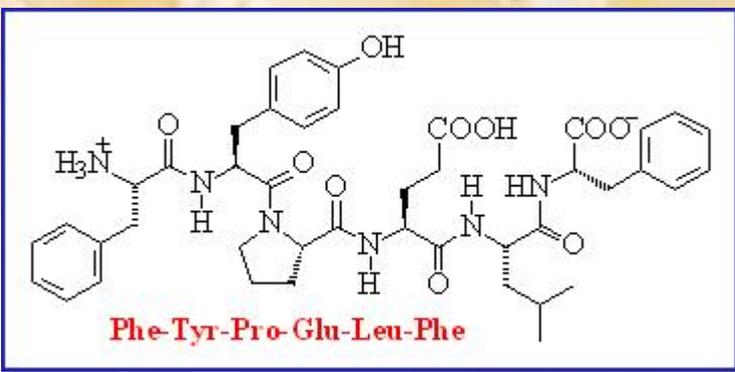
Produzione



Coagulazione



Caglio alternativo



Mucor miehei,
Mucor pusillis e
Endothia parasitica

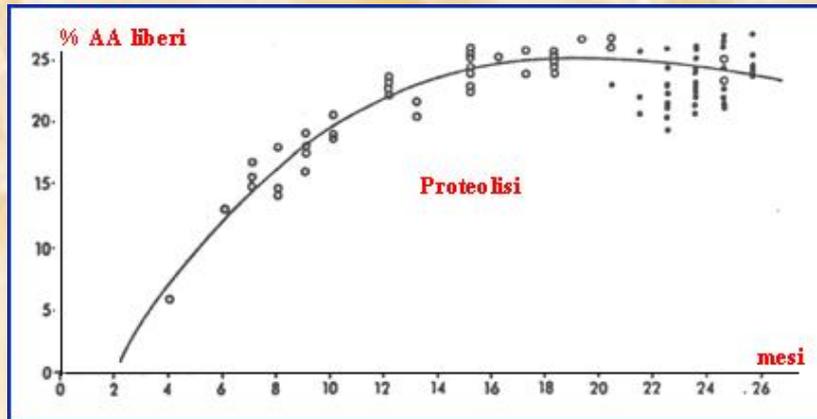
Esami e qualità



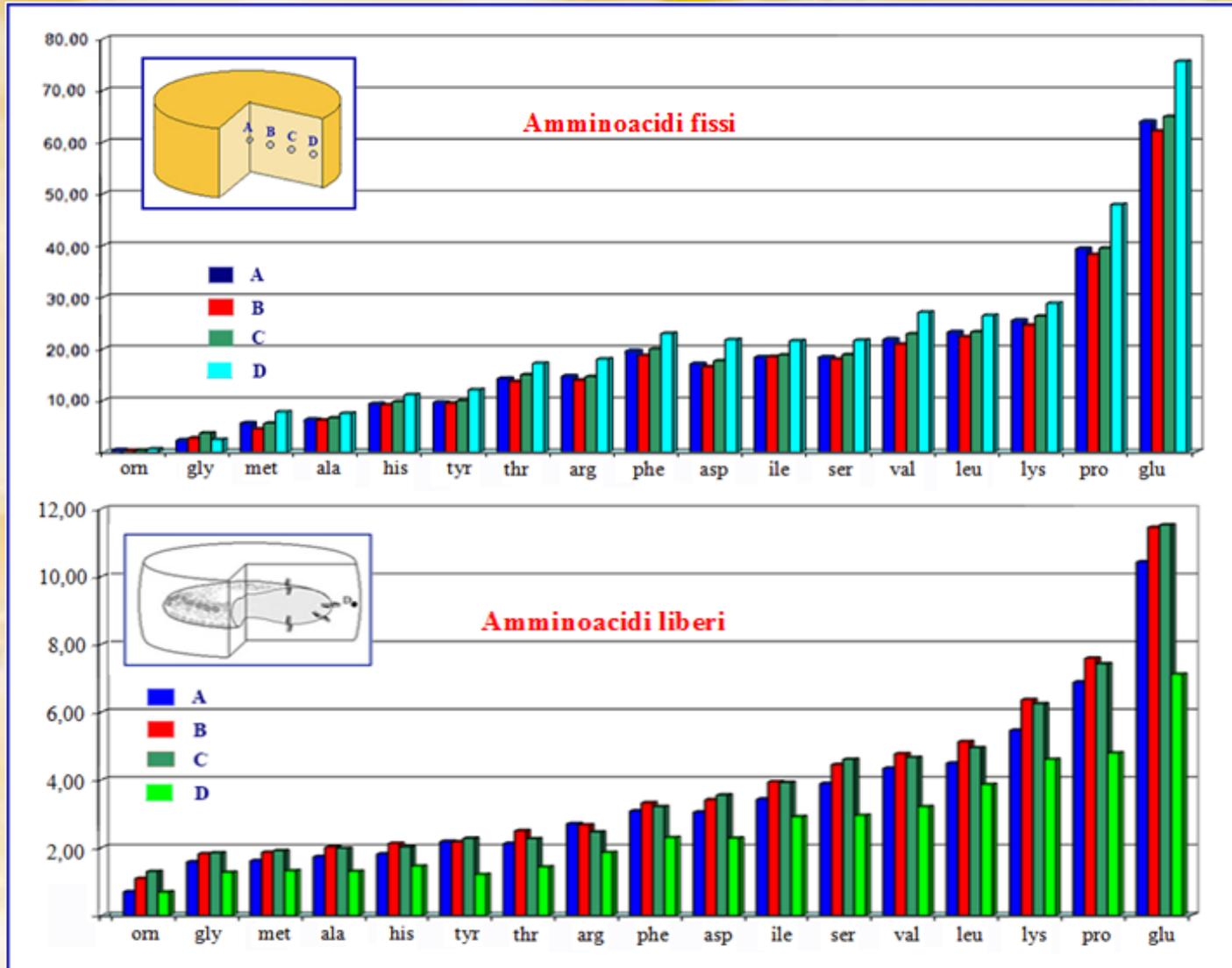
Stagionatura e maturazione

Migrazioni in tutta la forma
Migrazioni a corto raggio
Formazione delle scaglie

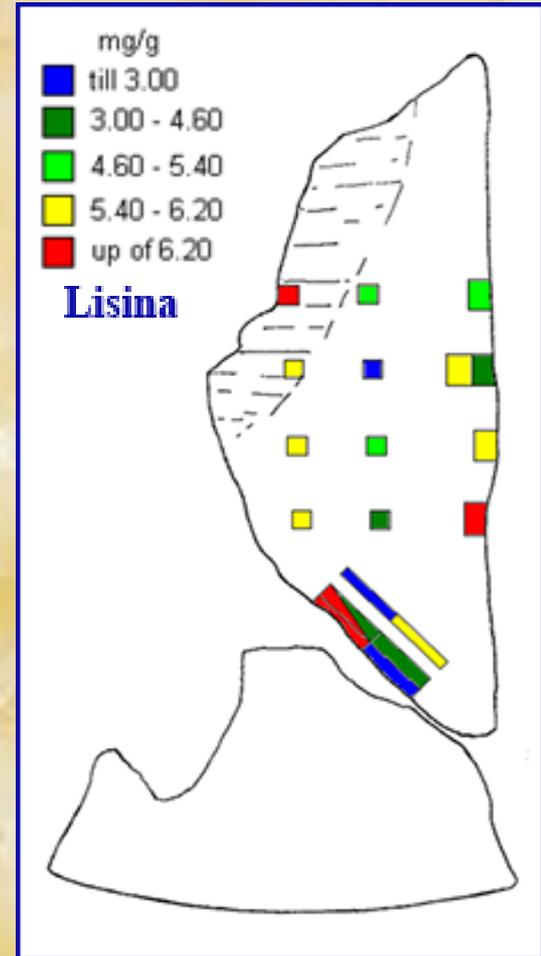
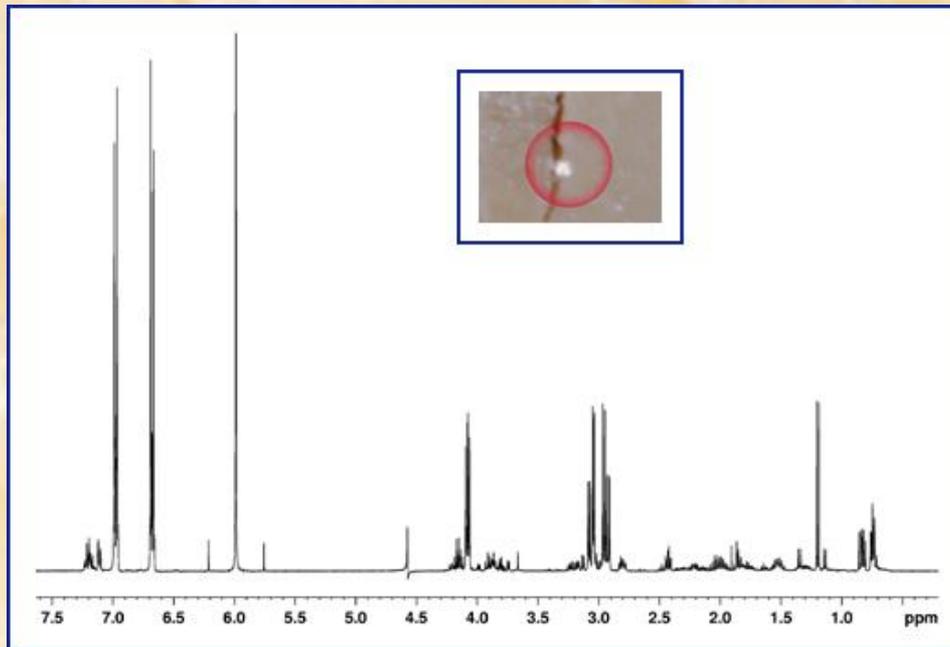
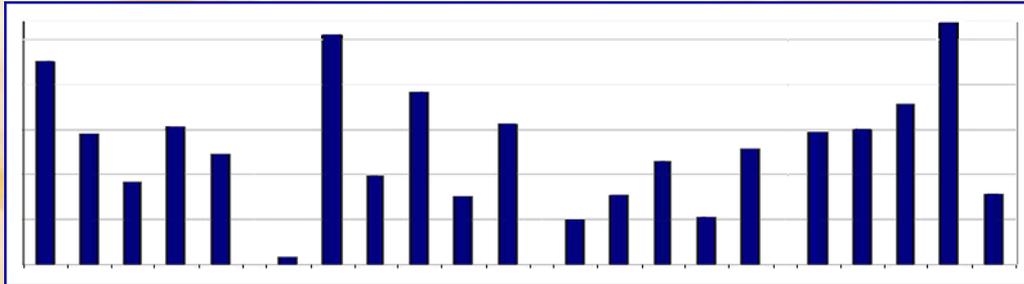
Proteolisi
Ossidazione lipidica
Attività batterica



Migrazione



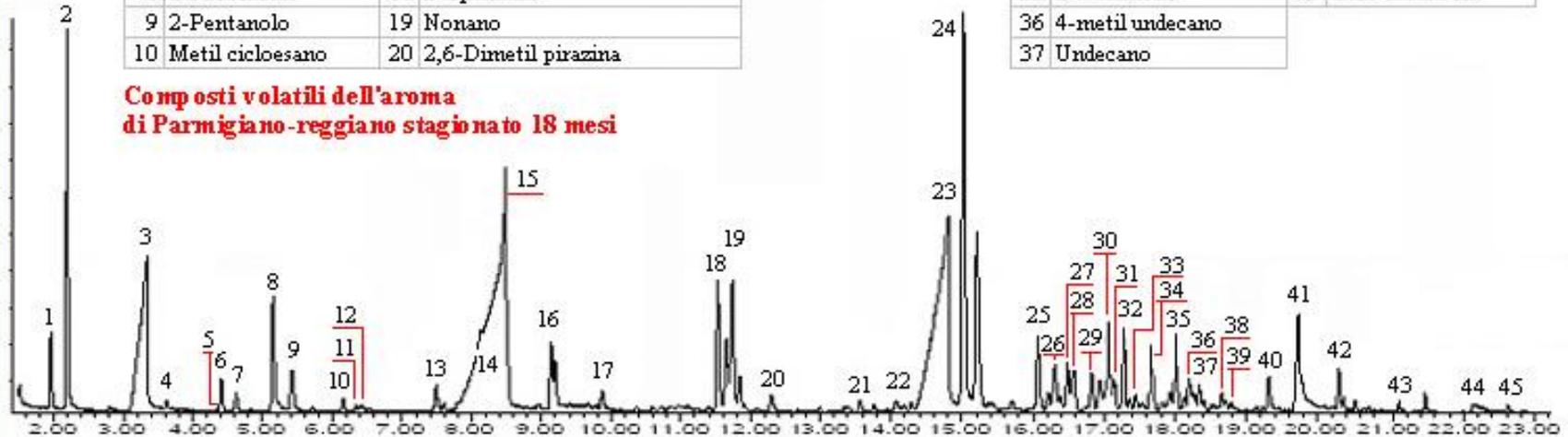
Migrazione locale



Aroma

1 Etanolo	11 3-Metil-3-buten-1-olo	21 4-Etil-1-ottene	28 Fenilacetaldeide	38 2-Metil undecano
2 Acetone	12 3-Metil-1-butanolo	22 Benzaldeide	29 2,4,5-Trimetil ottano	39 Nonanale
3 Acido acetico	13 Toluene	23 Acido esanoico	30 2,6,7-Trimetil ottano	40 1-Nonen-3-one
4 Etile acetato	14 Acido butanoico	24 Etile esanoato	31 2,8-Dimetil nonano	41 Acido ottanoico
5 2-Butenale (E)	15 Etile butanoato	25 2-Etil-1-esanolo	32 4,6-Dimetil nonano	42 Etile ottanoato
6 3-Metil butanale	16 2,4-Dimetil eptano	26 2-Propil-1-pentanolo	33 2,7-dimetil nonano	43 2-Undecanone
7 2-Metil butanale	17 4-Idrossi-4-metil-2-pentanone	27 2,5,6-Trimetil ottano	34 3-Metil undecano	44 Acido decanoico
8 2-Pentanone	18 2-Eptanone		35 2-Nonanone	45 Etile decanoato
9 2-Pentanolo	19 Nonano		36 4-metil undecano	
10 Metil cicloesano	20 2,6-Dimetil pirazina		37 Undecano	

**Composti volatili dell'aroma
di Parmigiano-reggiano stagionato 18 mesi**



Aldeidi: nota pungente, penetrante e fruttata

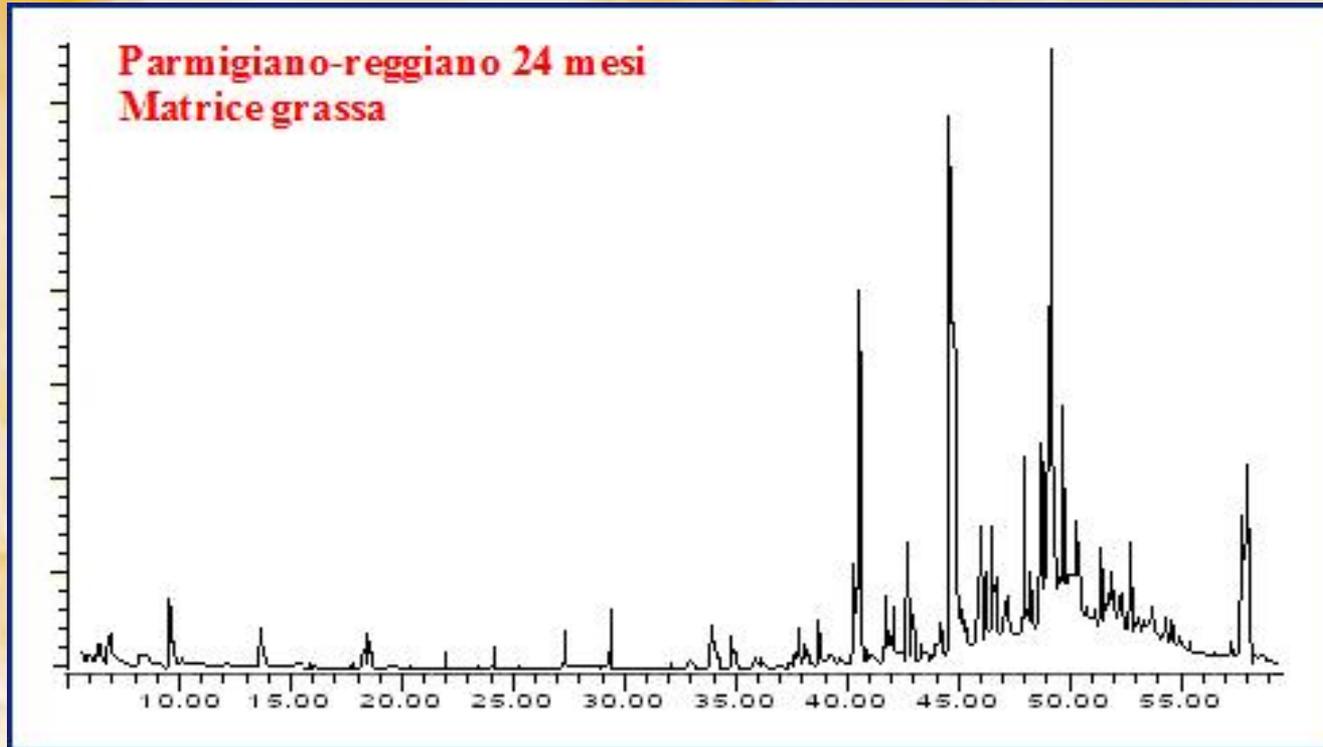
Alcoli: nota erbacea e florale

Esteri: affinamento della nota fruttata

Chetoni: nota grassa e dolce

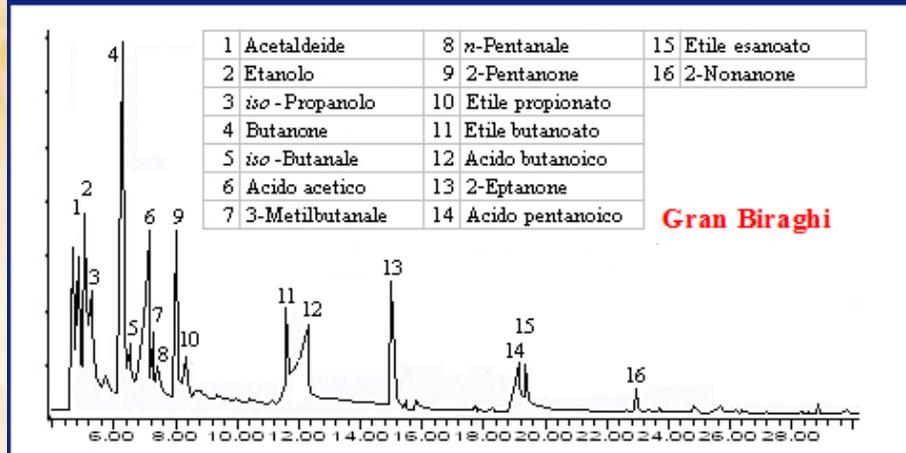
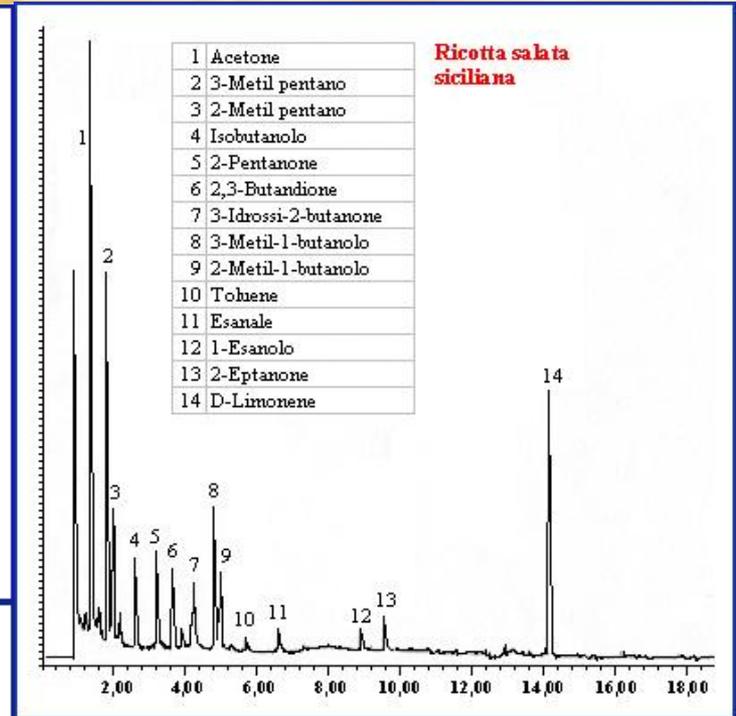
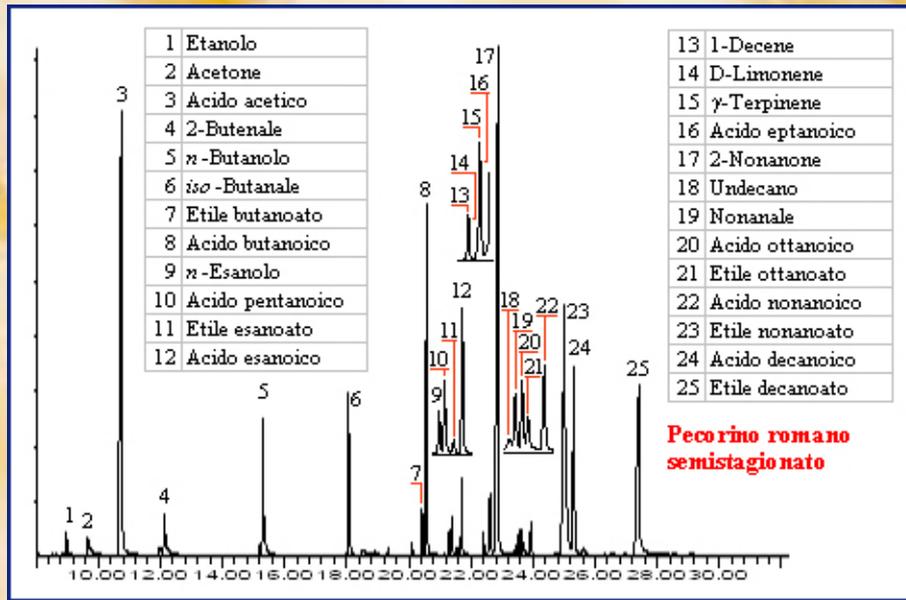
Acidi: odore pungente, grasso

Matrice grassa

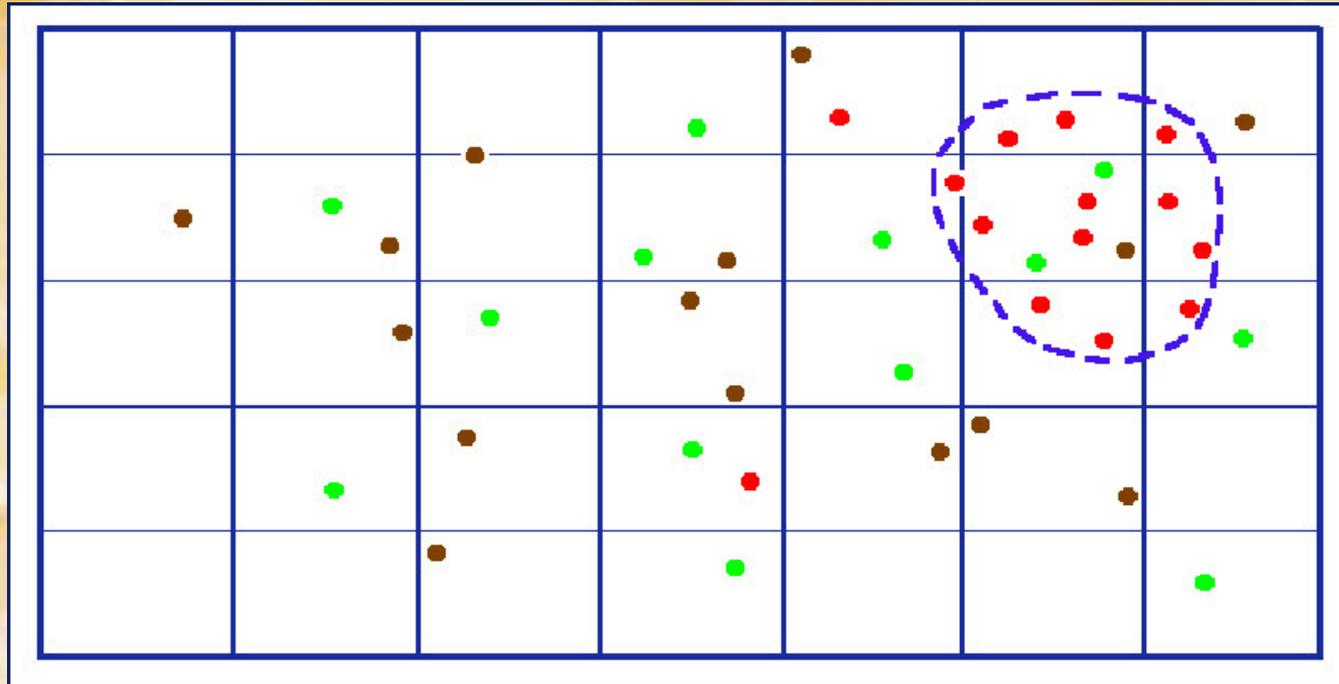


Miscela irresolvibile di composti grassi ad altro peso molecolare, di steroidi e di sostanze derivanti dalla decomposizione non idrolitica delle proteine

Aromi a confronto

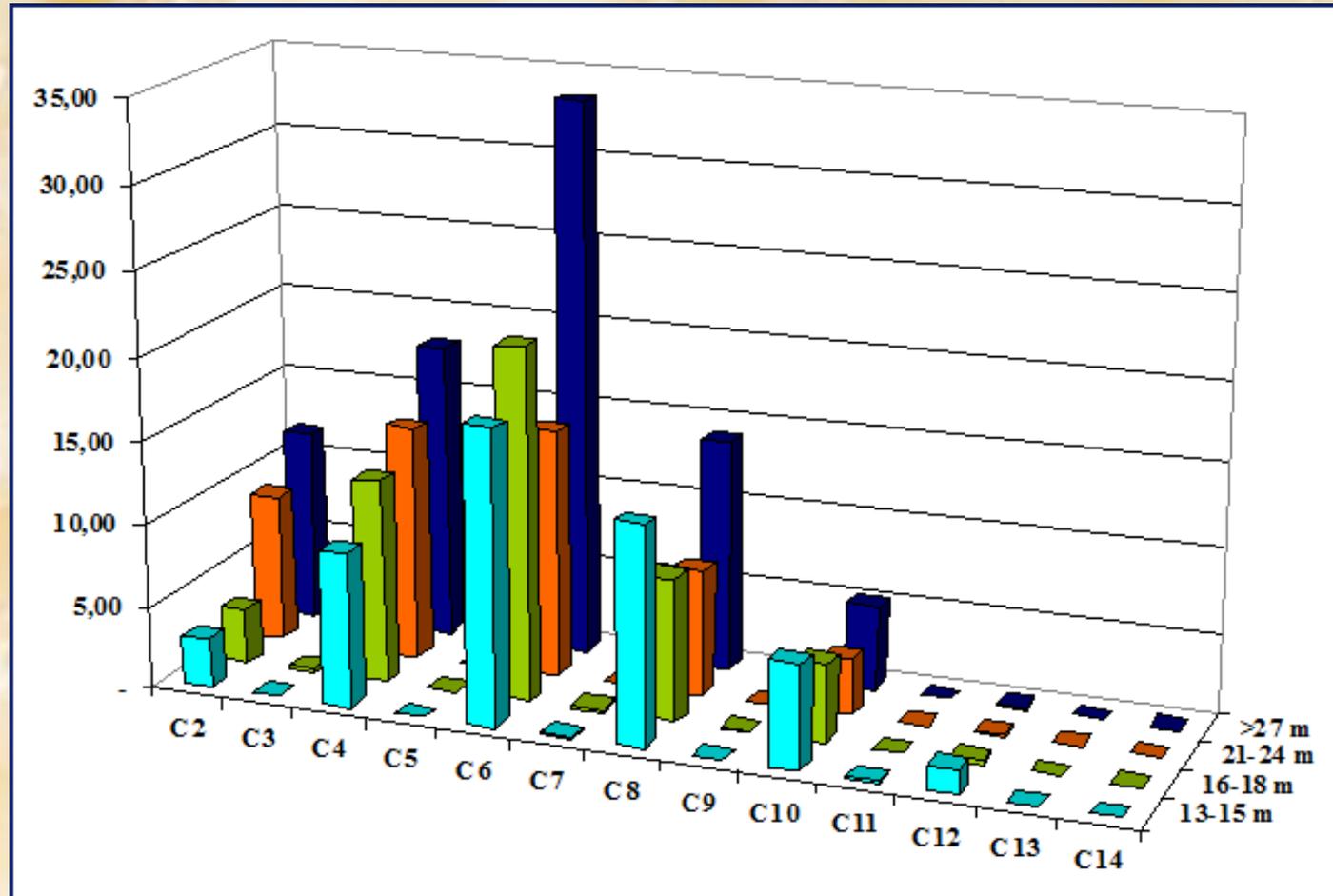


Indagine statistica

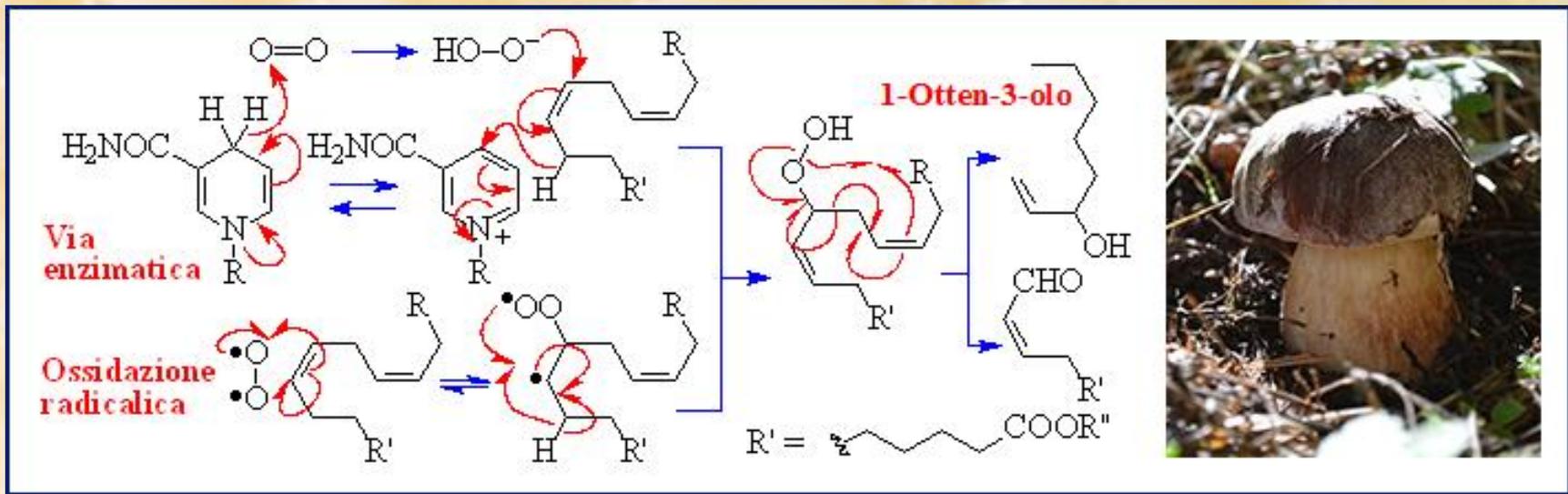
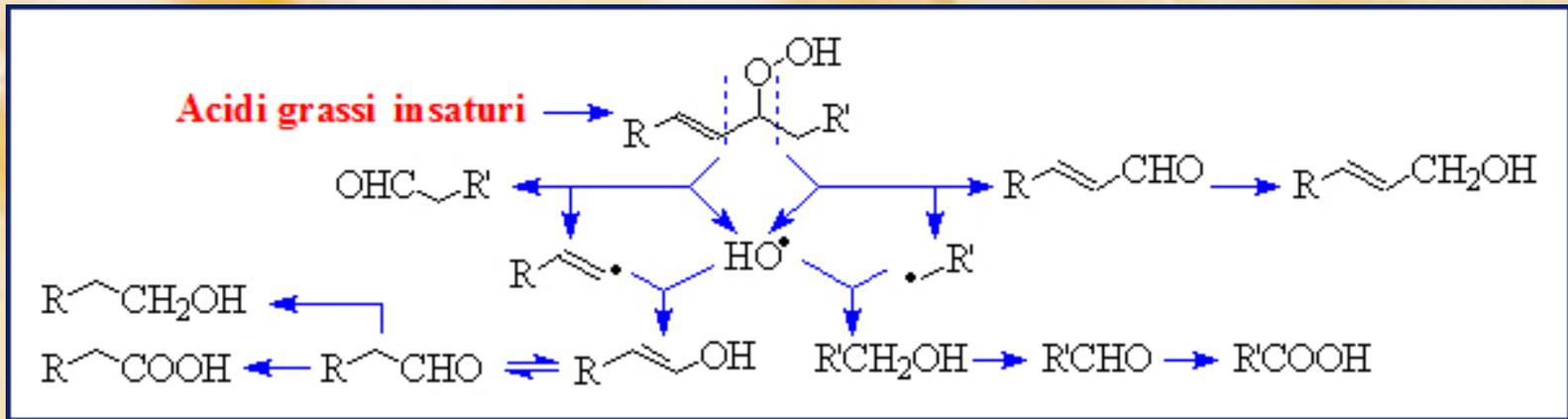


-  Montagna
-  Prima collina, fascia pedemontana
-  Bassa pianura

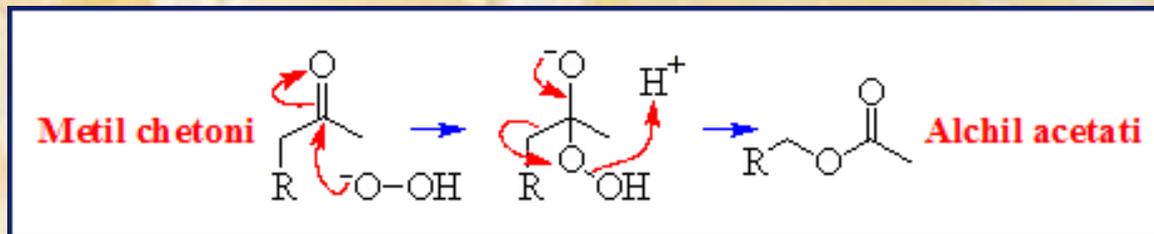
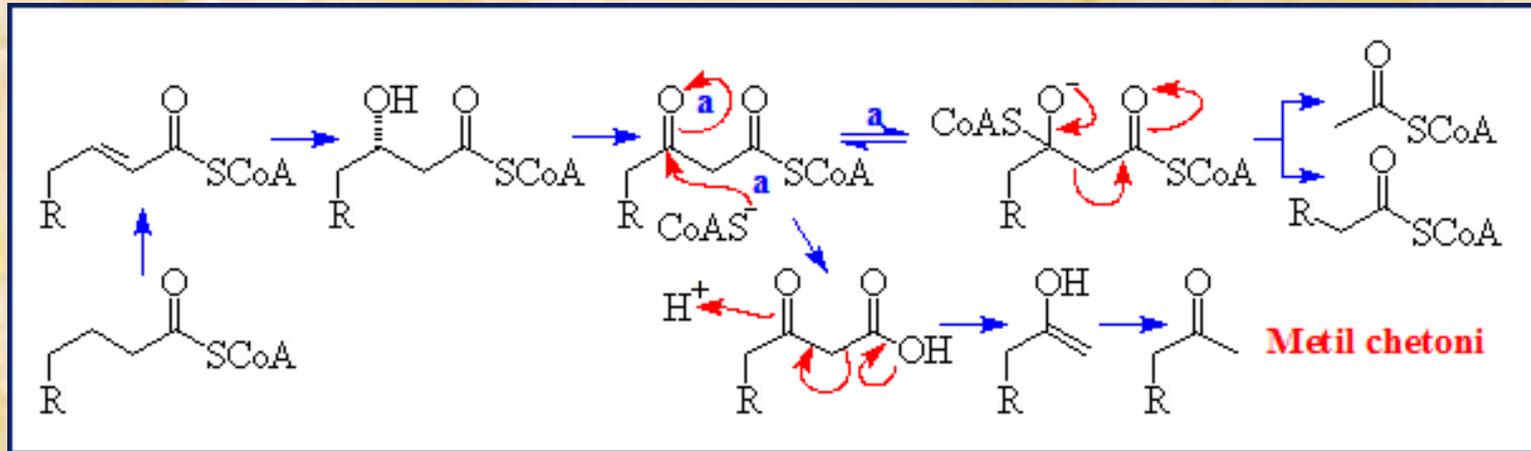
Acidi grassi- lipolisi



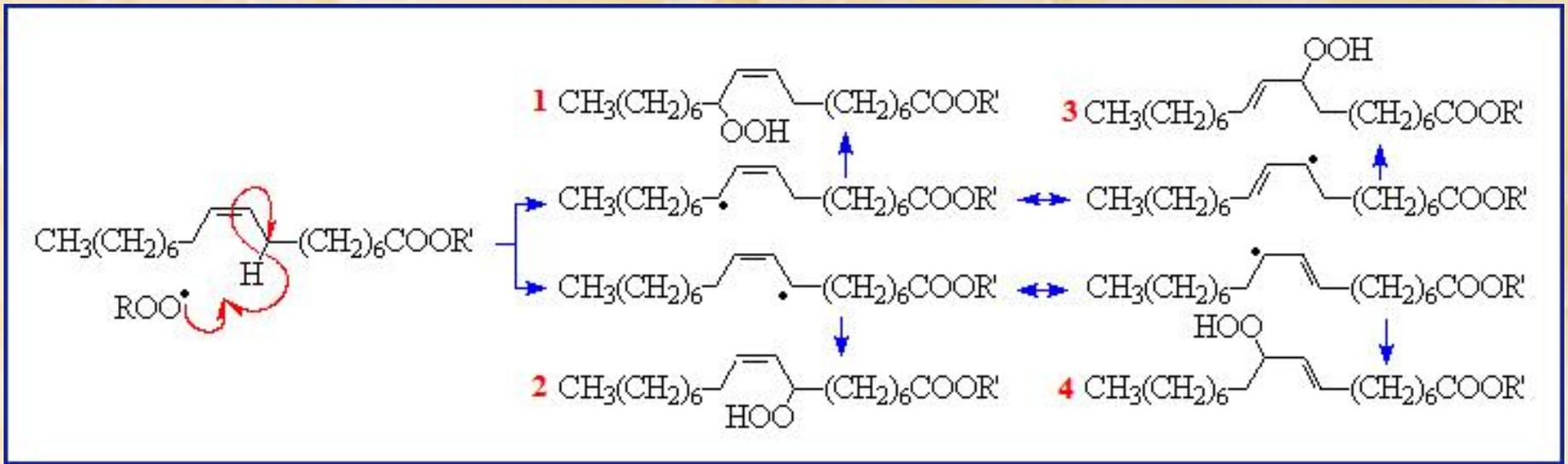
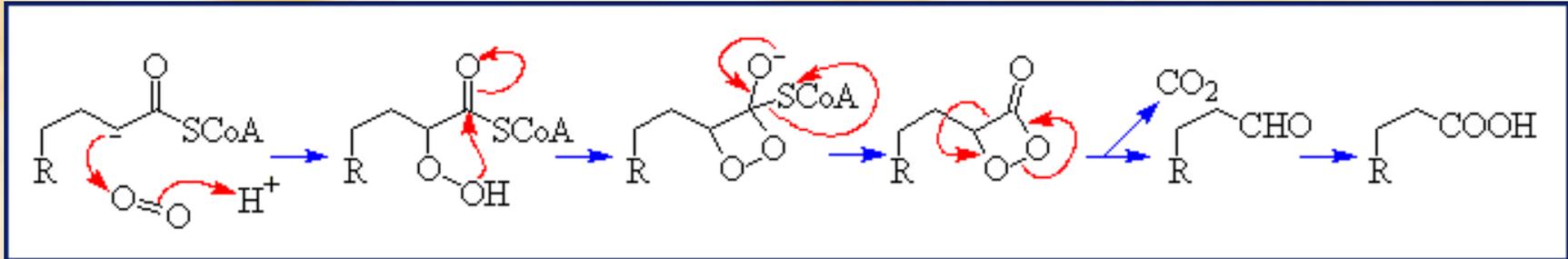
Ossidazione lipidica



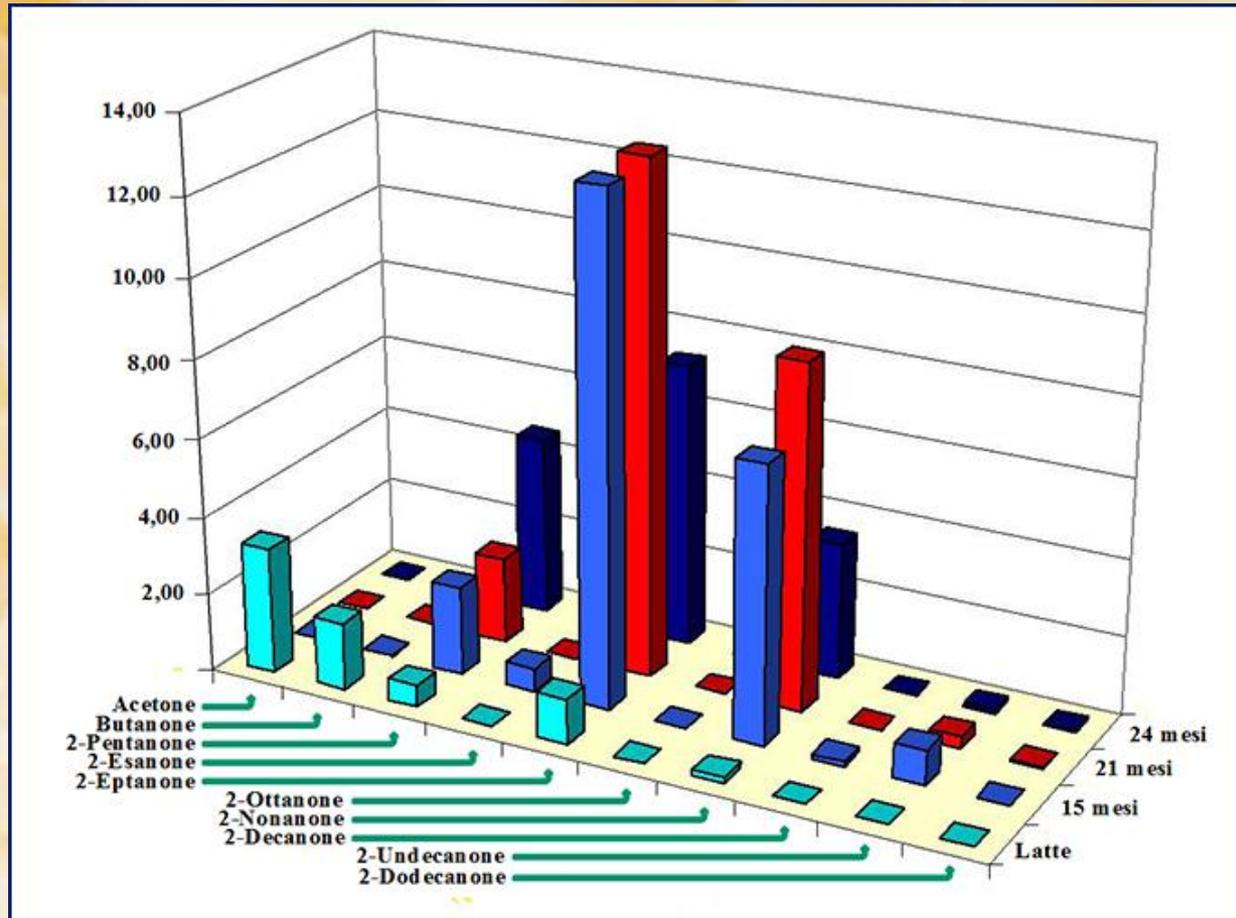
Ossidazione lipidica - bis



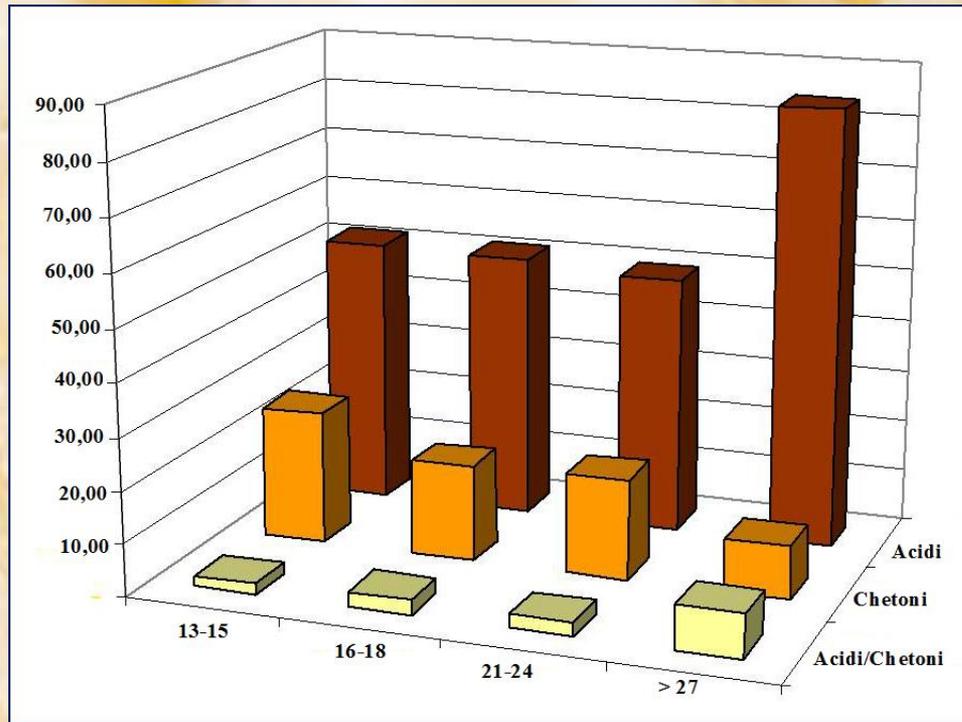
Ossidazione lipidica - ter



Metil chetoni



Rapporto acidi/chetoni

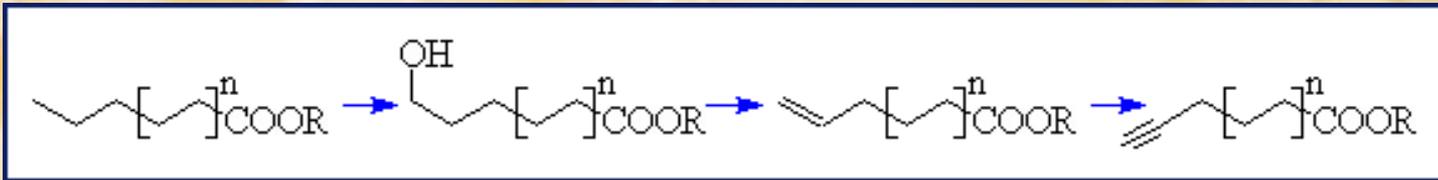


* concentrazione (ppm) in acqua

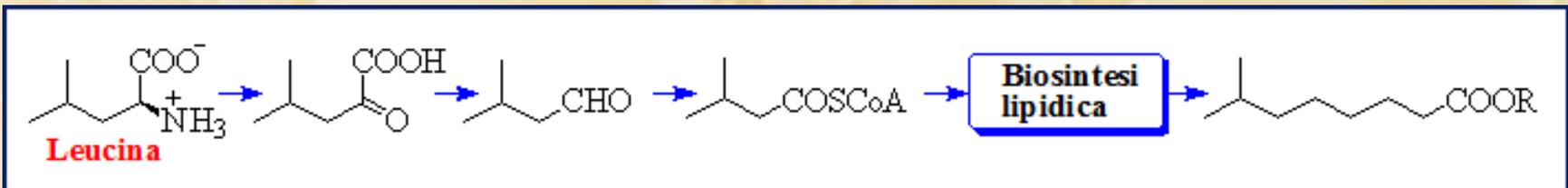
Chetoni		*	Acidi grassi		*
2-Pentanone	Fruttato	2300	Butanoico	Rancido	50
2-Esanone	Dolce, fruttato	930	Esanoico	Rancido, di capra	85
2-Eptanone	Erbaceo	650	Ottanoico	Saponoso, muschiato	200
2-Ottanone	Fresco, florale	190	Decanoico	Saponoso	400
2-Nonanone	Florale, grasso	190	Dodecanoico	Saponoso	>400

Acidi grassi “anomali”

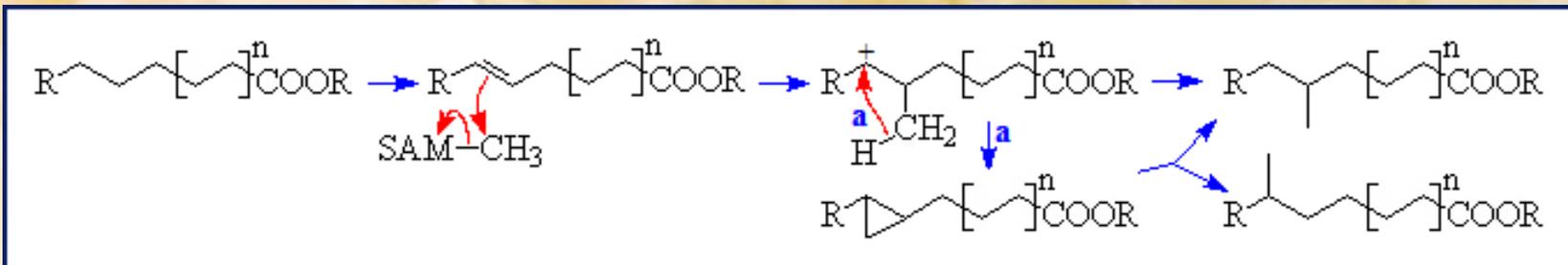
Con terminale insaturo



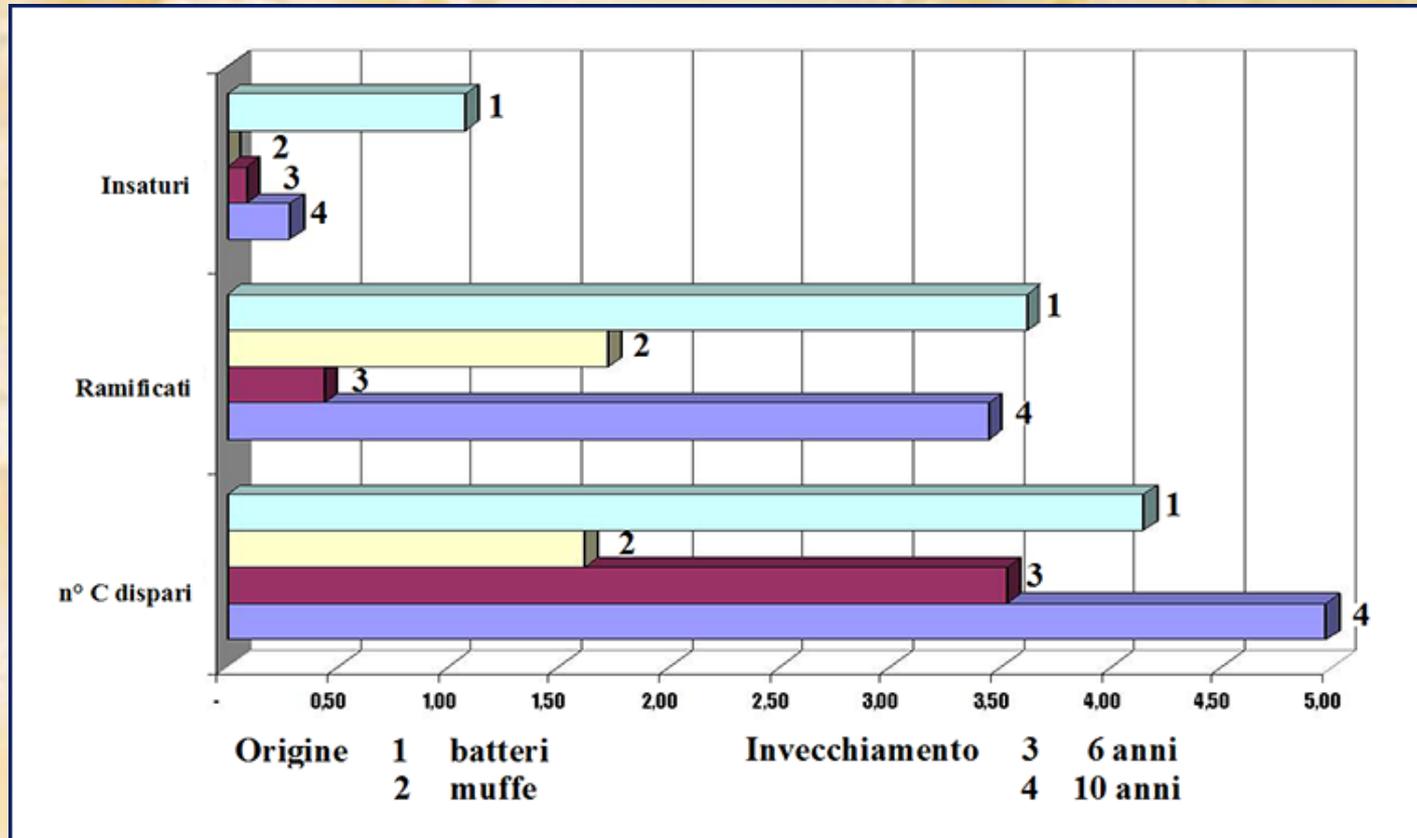
Con ramificazione terminale



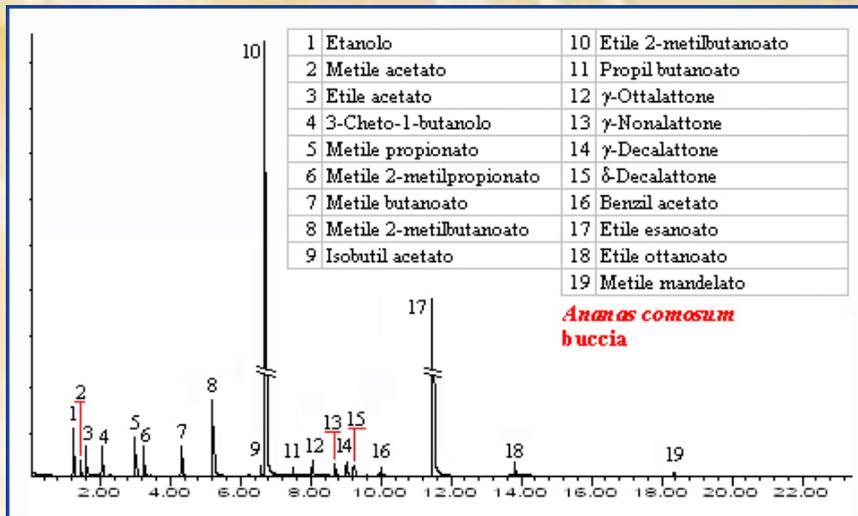
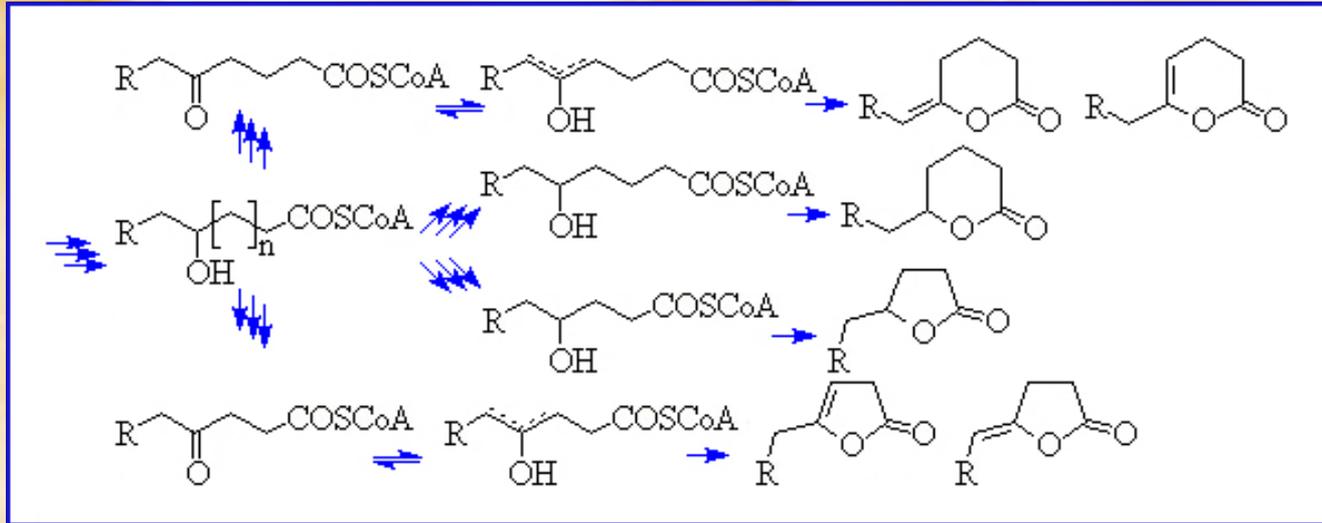
Con ramificazione interna



Acidi anomali in super invecchiamento

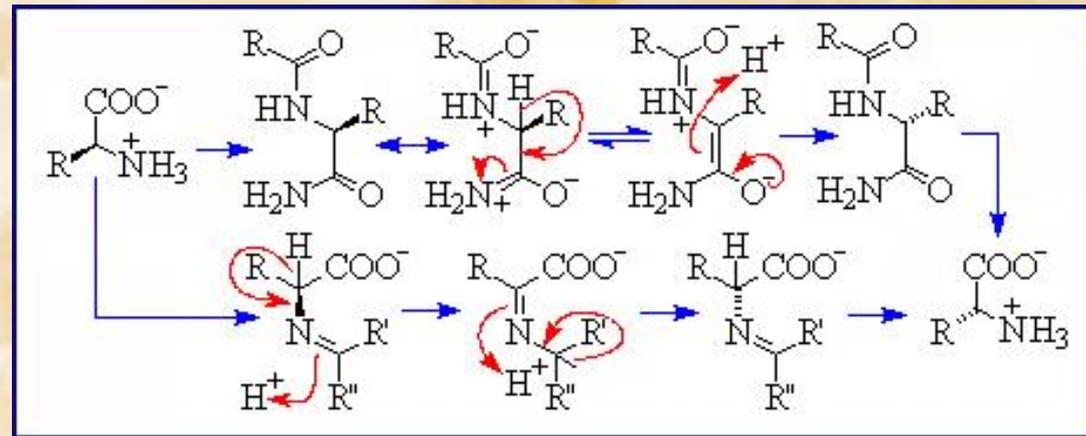


Lattoni



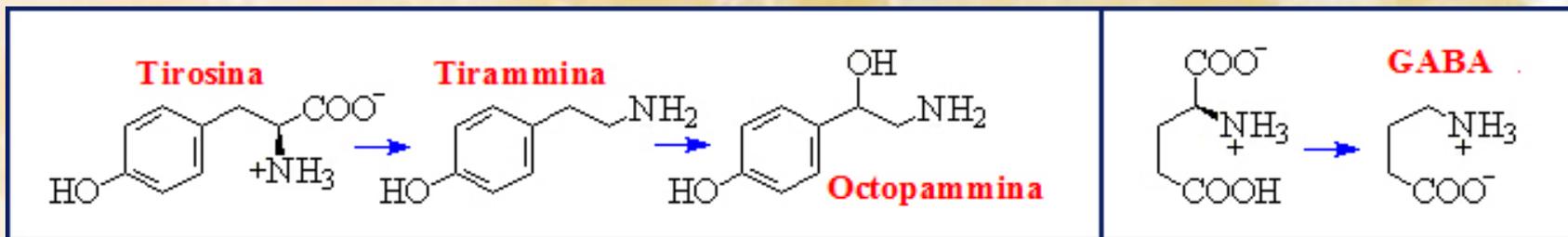
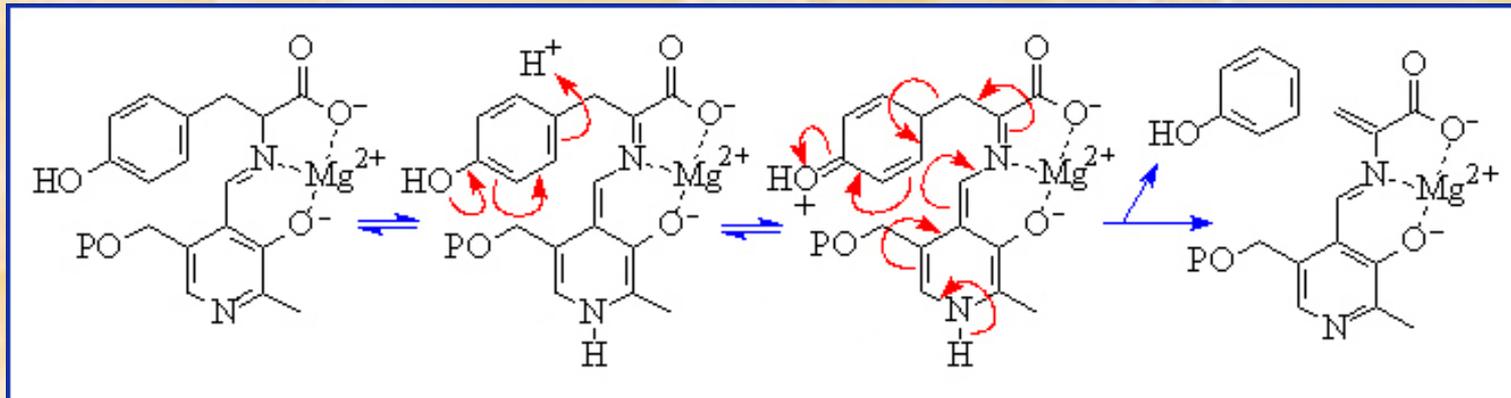
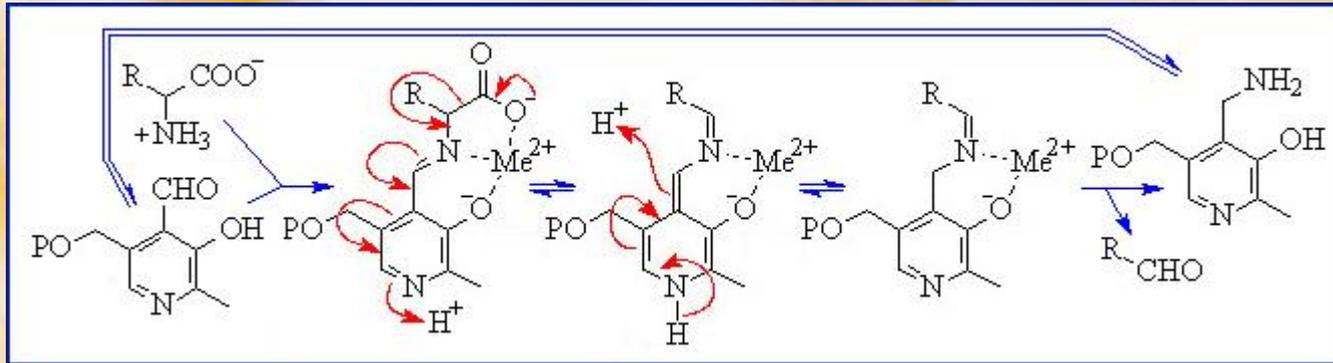
Odore fruttato

Epimerizzazione di amminoacidi



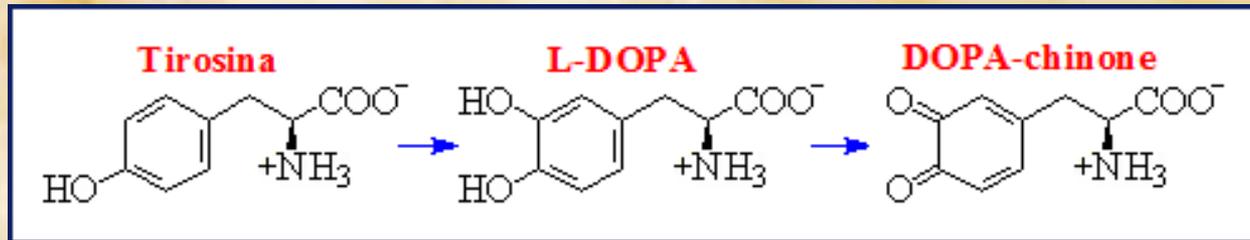
	Sapore dolce	nota		Sapore dolce	nota
Gly	debole		Ala	molto intenso	
Thr	debole	acida	Ser	debole	acida
Met	debole	amara	Cys	insipore	
Val	debole	amara	Leu	debole	amara
Ile	insipore		Phe	debole	amara
Trp	debole	amara	Glu	assente	acida
Asp	assente	acida	Gln	debole	acida
Asn	debole	acida	His	debole	amara
Lys	insipore		Arg	medio	amara
Pro	assente	molto amara			

Derivati di aminoacidi

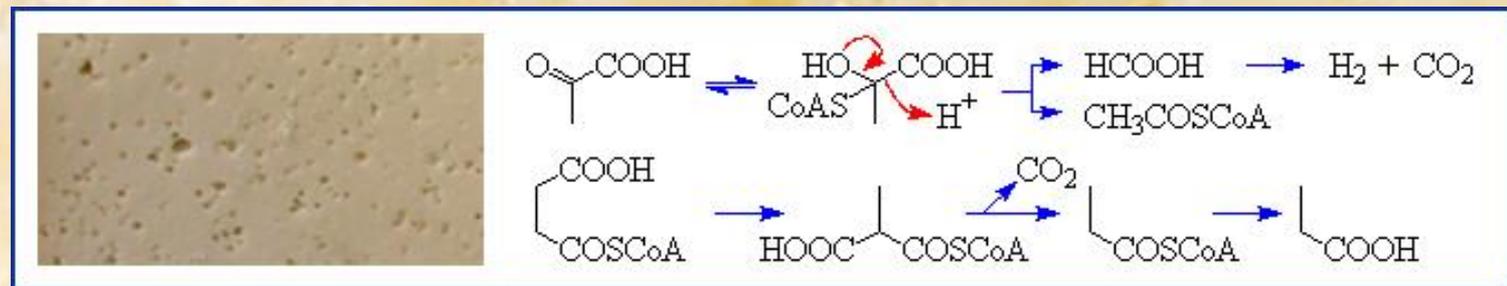
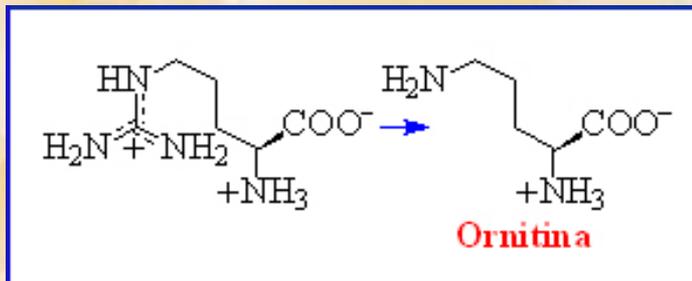


Difetti

Colore rossastro

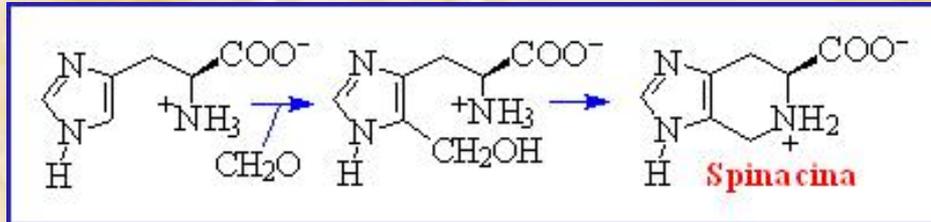


Gonfiore

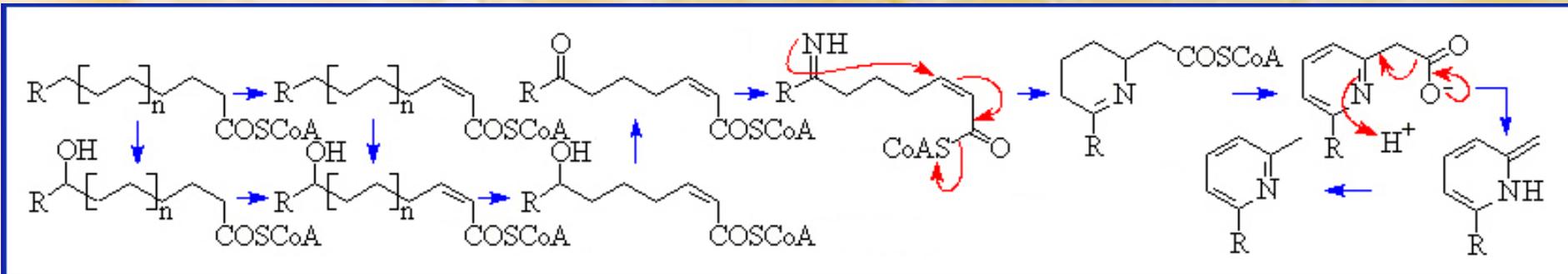
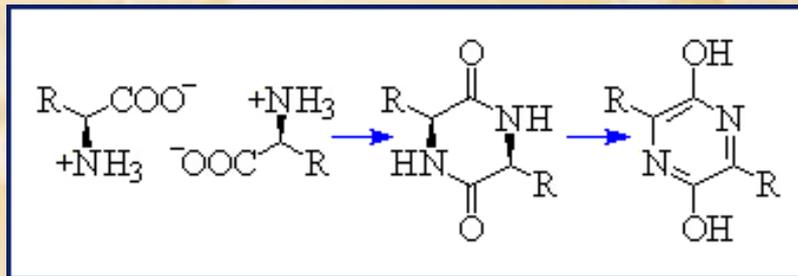


Difetti bis

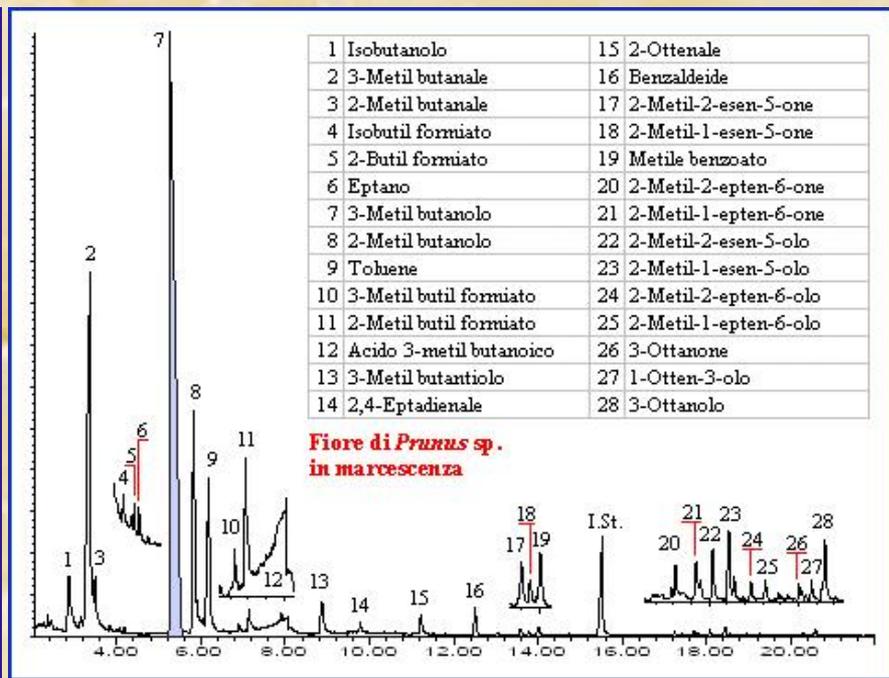
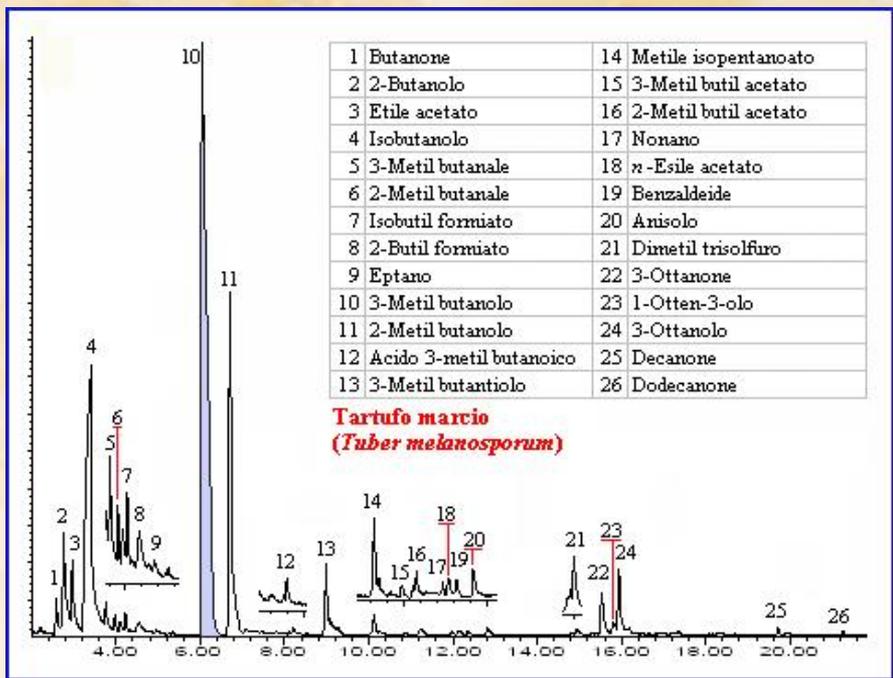
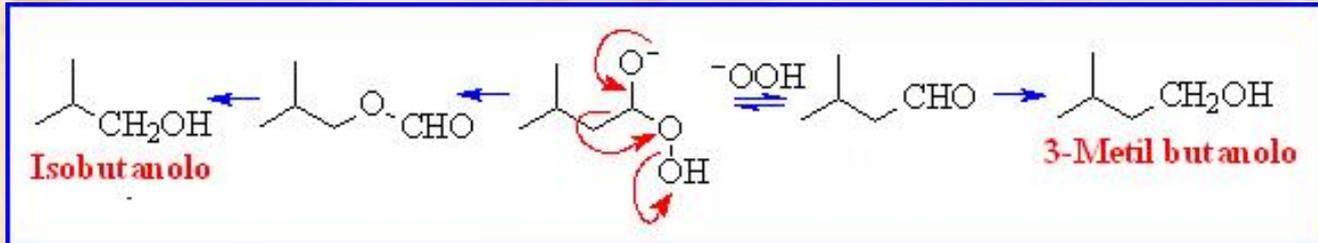
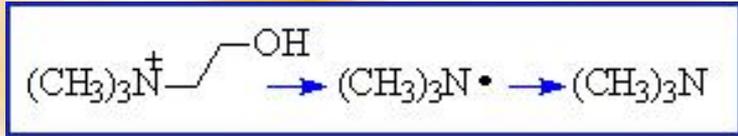
Presenza di antifermentativi



Odore di “cotto”



Marciume



Prof. Gyula Palyi
Prof. Adriano Pinetti
Prof. Franco Bellesia
Dr.ssa Claudia Zucchi

Prof. Bart Weimer
Prof.ssa Livia Simon
Dr. Janos Csapo

Dr. Sergio Prandi
Dr.ssa Sabrina De Paola
Dr. Simone Cocchi
Dr. Gian Luca Garuti
Dr. Luca Pignatti
Marcello Vezzani

