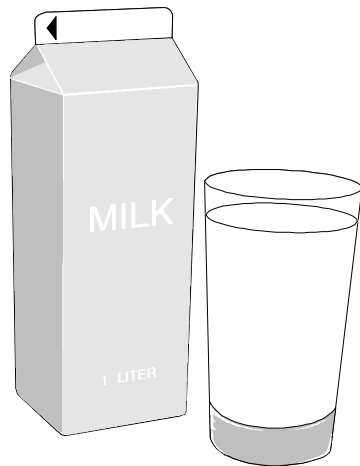


AS-1083



# Detecting and Correcting Off-Flavors in Milk

**J.W. Schroeder**  
Extension Dairy Specialist

**Sam Beattie**  
Assistant Professor, Food and Nutrition

A pleasantly sweet, refreshing milk flavor is the key to consumer acceptance. **Flavor quality starts at the farm.** Make it a practice to check the flavor of your milk regularly because milk flavor can change in quality suddenly, if production conditions are altered. For most effective flavor evaluation, milk samples should be warmed in the 55 to 70 degrees Fahrenheit range. Temperatures below 50° F tend to mask potential off-flavors.

Off-Flavors	Causes	Prevention
<b>Feed</b> Aromatic, odorous or unnaturally too sweet	<ul style="list-style-type: none"> <li>• Cows eating or <i>inhaling odors</i> of strong feeds 1-3 hours prior to milking (corn or grass silage, hay or haylage, wild onions or other weeds).</li> <li>• <i>Sudden</i> changes in roughage.</li> <li>• Poor ventilation in building.</li> </ul>	<ul style="list-style-type: none"> <li>• Withhold objectionable feed or remove cows from pasture one to three hours prior to milking, feed aromatic roughages after milking.</li> <li>• Make feed changes gradually.</li> <li>• Provide good barn ventilation.</li> </ul>
<b>Oxidized</b> Cardboardy, metallic, tallowy, puckery-mouth feel	<ul style="list-style-type: none"> <li>• Exposure to "white metal"* or rusty surfaces on milk handling equipment. This includes copper tubing from hot water heater, "white metal" elbows or fittings in milk lines or cleaning lines and/or rust in the wash-up sink.</li> <li>• Copper, iron or manganese in water supply.</li> <li>• Excessive use of chlorine sanitizers.</li> <li>• Exposure of milk to sunlight or fluorescent lighting.</li> </ul>	<ul style="list-style-type: none"> <li>• Use only high quality stainless steel, glass, plastic or rubber for all milk contact surfaces.</li> <li>• Water treatment/softening may be necessary.</li> <li>• Use iodophor sanitizers preferably.</li> <li>• Protect milk from exposure to sunlight or fluorescent lighting, cover glass pipelines.</li> </ul>
<b>Spoiled or Unclean</b> Unpleasant aftertaste, "dirty," spoiled or fruity	<ul style="list-style-type: none"> <li>• Psychrotrophic (spoilage) bacteria.</li> <li>• Dirty milk handling equipment (bulk tank, milk pipelines and/or milking machines).</li> <li>• Dirty cows due to poorly maintained loafing or feeding areas.</li> <li>• Improper preparation (washing) of cows for milk.</li> <li>• Failure to dry teats before milking.</li> </ul>	<ul style="list-style-type: none"> <li>• Clean all milk handling equipment properly. Sanitize just prior to use.</li> <li>• Clean facilities and cows.</li> <li>• Handle milking equipment properly.</li> <li>• Wash and dry udders prior to milking.</li> </ul>
<b>Rancid</b> Bitter, soapy, blue cheese-like aroma	<ul style="list-style-type: none"> <li>• Excess agitation or foaming of raw milk (air leaks).</li> <li>• Admission of excessive air at the claw or fittings.</li> <li>• High blend temperature of milk.</li> <li>• Late lactation (over 305 days) or low production cows.</li> <li>• Low protein content of cow rations.</li> </ul>	<ul style="list-style-type: none"> <li>• Keep fittings tight and air admission to a minimum. Avoid risers and overhead lines. Don't run milk pumps in starved condition.</li> <li>• Restrict air admission, prevent equipment leaks.</li> <li>• Cool milk to at least 40° F and maintain.</li> <li>• Discard milk from low producing or late lactation cows.</li> <li>• Use balanced cow rations.</li> </ul>
<b>Malty and/or High Acid</b> Grapenut-like and/or sour	<ul style="list-style-type: none"> <li>• Soiled, unclean milk handling equipment.</li> <li>• Slow or insufficient cooling of milk.</li> </ul>	<ul style="list-style-type: none"> <li>• Rinse and clean milk handling equipment after each use and properly sanitize.</li> <li>• Promptly cool milk to 40° F and maintain.</li> </ul>
<b>Foreign Flavors</b> a. Medicinal/chemical b. Disinfectant	<ul style="list-style-type: none"> <li>• Medications, chemicals and/or insecticides improperly used or stored.</li> <li>• Excessive concentration, improper use and/or inadequate drainage of sanitizing agents.</li> </ul>	<ul style="list-style-type: none"> <li>• Use <i>approved</i> medications and insecticides with caution and according to directions.</li> <li>• Avoid strong smelling sanitizers and disinfectants; <b>use recommended concentrations.</b></li> </ul>

\* "White metal" is the term applied to a form of low quality stainless steel which has substantial copper content. Metallic flavor in milk results from electrolytic processes between stainless steel and copper, rust or manganese.

— Adapted from D.K. Bandler et al. "Milk Flavor Handbook," Cornell, Rutgers and Pennsylvania State University, 1976, with revisions by F.W. Bodyfelt, Extension Dairy Processing Specialist, Oregon State University, 1985.

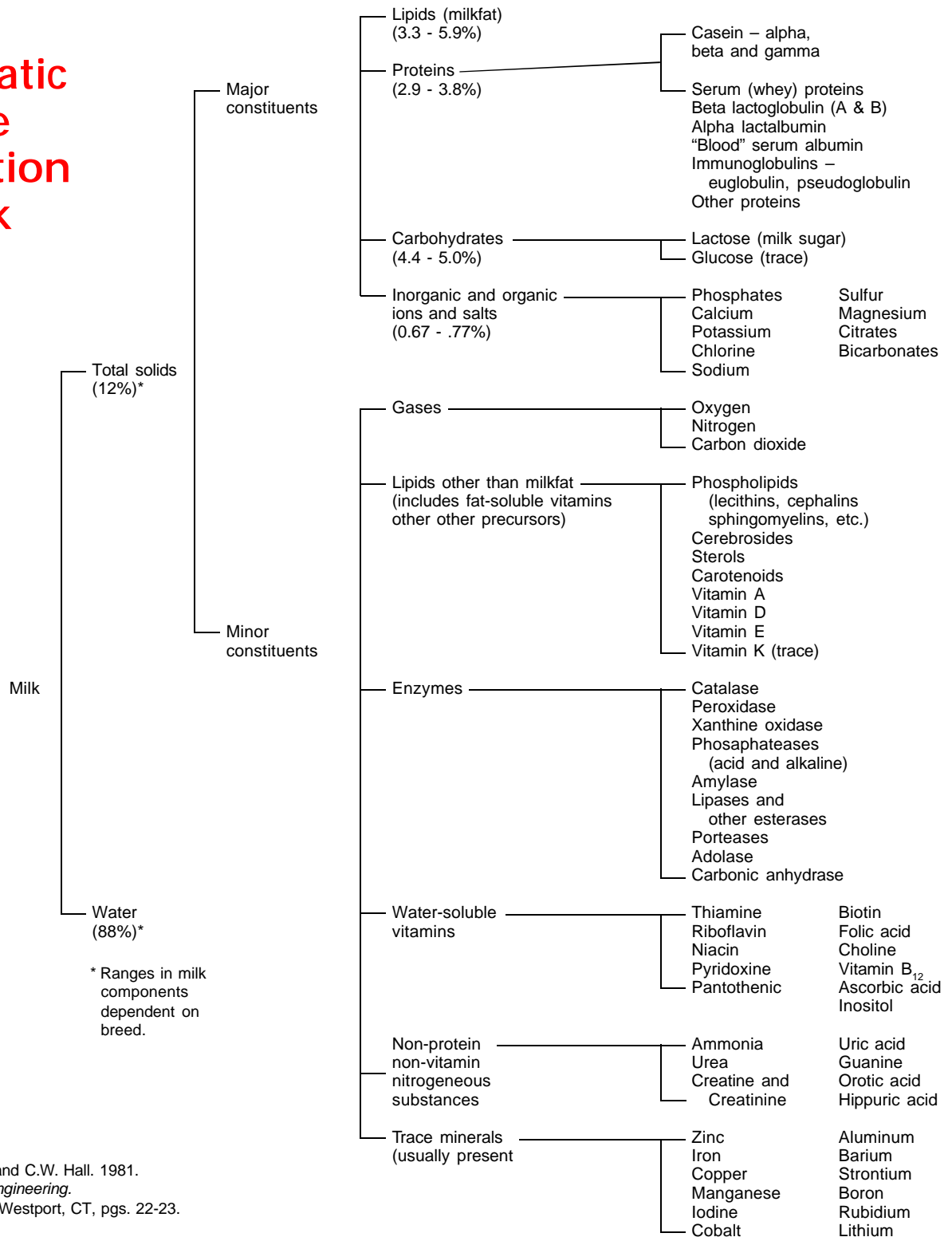


**OSU EXTENSION SERVICE**

Small Extension Office | Extension Service | OSU | 1994

JULY 1994

# A Schematic on the Composition of Milk



Reference: Haper, W.J. and C.W. Hall. 1981.  
*Dairy Technology and Engineering.*  
 AVI Publishing Co., Inc., Westport, CT, pgs. 22-23.

*For further information,  
 contact your dairy fieldman, State Dairy Commissioner or county office of the NDSU Extension Service*

