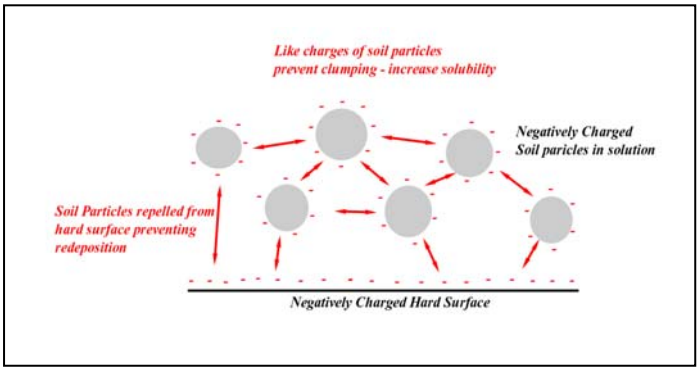
CLEANING FOR INFECTION CONTROL
DETERGENTS –WHY ALKALINE ?

The Australian Standards AS/NZS 4815-2001 & AS/NZS 4187-2003 recommends the use of **mild alkaline detergents** (pH 8.0-10.8) for cleaning. **Alkaline detergents are recommended because they clean better** than neutral or acidic detergents.

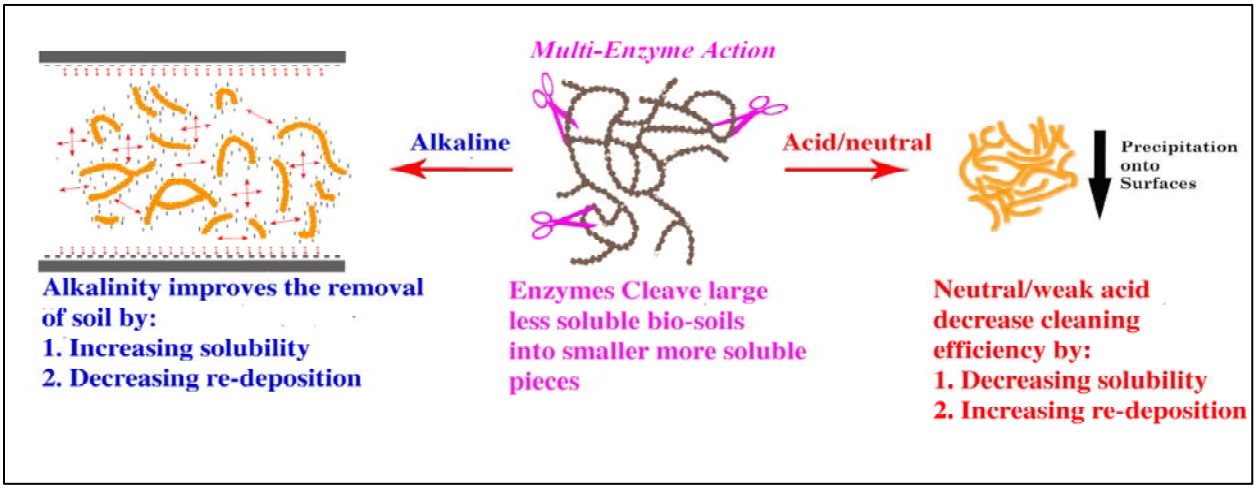
Why alkaline detergents clean better;

Surfaces	Alkalinity **helps keep soil particles suspended** in the cleaning solution, this **prevents "clumping" and re-deposition** of soil onto the cleaned surface.
Fatty Acids	Alkalinity converts insoluble fatty acids into their **more soluble** salts making **them easier to wash away**.
Proteins	Alkalinity helps to **increase the solubility of proteins**.
Hard Water	Alkaline builders help remove calcium and magnesium (soften the water) which **improves the performance of surfactants in the detergent**.
Metal	Alkaline builders help **prevent corrosion of metal.** Some alkaline ingredients have anti-corrosion properties. Corrosion of steel is at a minimum in mild alkaline solutions (pH 8.5-10) compared to neutral or mild acid solutions where corrosion can be more significant.



Hard Surfaces and Particulates.

Alkaline solutions produce a negative charge on surfaces & suspended soil. Particulates with a negative charge will repel each other, and prevent "clumping". Instrument surfaces will also be negatively charged and repel the particulates – reducing re-deposition of soils onto the cleaned surfaces.



These advantages also apply to enzyme containing detergents, with an added advantage. Most protease enzymes used in detergents are alkaline proteases – meaning they function best in alkaline solutions.

Acids and Bases - Alkalinity and pH

To understand the significance of alkalinity in the cleaning process it is useful to be familiar with the meaning of alkalinity and pH, and the chemical properties of the main components of biologically derived soils.

Example	*pH*	*Description*
Sulphuric acid	0	Strong Acid
	1	
Stomach acid	2	
Vinegar Carbonated soft drinks	3	
Tomato Juice	4	Mild Acid
Coffee	5	
Milk	6	Physiological Region
Saliva Pure water Blood	7	
Sea water Sodium bicarbonate	8	
Borax	9	Mild Alkaline
Detergents		
	10	
Household hardsurface cleaners	11	
Sodium carbonate	12	
Oven cleaner	13	Strong Alkaline
Draino/ Automatic Dishwashing	14	

The pH Scale

Acids and Bases - Alkalinity and pH

Acids and bases are a regular part of our daily life, vinegar and lemon juice are acidic while sodium bicarbonate (baking soda) and ammonia are basic (alkaline).

The acidity or alkalinity of an aqueous solution is measured using the pH scale (Figure 1.1). On the pH scale pure water is considered neutral with a pH = 7.0. Acids have pH values less than 7.0 and alkaline solutions have pH values greater than 7.0.

Acidic solutions have an increasing concentration of positive ions ($+H_3O$) as the strength of the acid increases. For alkaline solutions the concentration of hydroxide ions (-OH) increases with the strength of the base.

pH and Concentration

A change of one pH unit means a change of 10x the concentration of hydrogen ions or hydroxide ions. For example a pH of 7 = a concentration of 10^{-7} positive ions. A pH of 8 = a concentration of 10^{-8} positive ions.

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