

# LUBE!

AN IN-DEPTH LOOK AT  
PERSONAL LUBRICANTS



Presented by:

**Sarah E. Mueller**

Lube Expert &  
Senior Sex Educator at

**Smitten Kitten**

an education based,  
progressive sex toy store  
for everybody!



## WHY USE LUBE?

- Makes sexual activities safer & safer sex barriers more effective
- Increases pleasure, decreases friction and irritation
- Allows for more comfortable use of sex toys
- Takes pressure off the body to “perform”
- Makes sexual activities possible for many folks

*But not all lubes are created equal...*

# TYPES OF LUBRICANTS

**Water Based**



















**Silicone Based**

**Hybrid**

**Oil Based**

# COMPATIBILITY

## Sex Toys and Safer Sex Barriers

| toy material<br>lube type <br> | SILICONE  | ABS<br>PLASTIC   | GLASS, STEEL,<br>WOOD, STONE  | SAFER SEX<br>BARRIERS   |
|--|---|--|---|---|
| WATER<br>BASED   |    |    |    |    |
| SILICONE<br>BASED  |    |    |    |    |
| HYBRID<br>water and<br>silicone together   |   |   |   |   |
| OIL<br>BASED   |  |  |  |  |

# MUCOUS MEMBRANES

**Epithelium:** the outermost layer of skin on the mucous membranes of the genitals, a primary defense against pathogen transmission

## Vulvovaginal Microbiome

- Vaginal Lining & Ectocervix:** Stratified squamous, non-keratinized epithelium
- Endocervix:** Single layer, non-keratinized, columnar Epithelium
- Mucosal Vulva & Vaginal Vestibule:** Non-keratinized mucocutaneous (transitional) epithelium
- Labia Majora:** Keratinized epithelium

## Anal Microbiome

- Rectum & Colon:** single layer, columnar, non-keratinized epithelium
- Anus:** Mucocutaneous epithelium containing both keratinized and non-keratinized stratified squamous epithelium types

## Penile Microbiome

- Urethral Opening:** Non-keratinized stratified squamous epithelium
- Preputial Mucosa (under intact foreskin):** Mucocutaneous, lightly keratinized epithelium



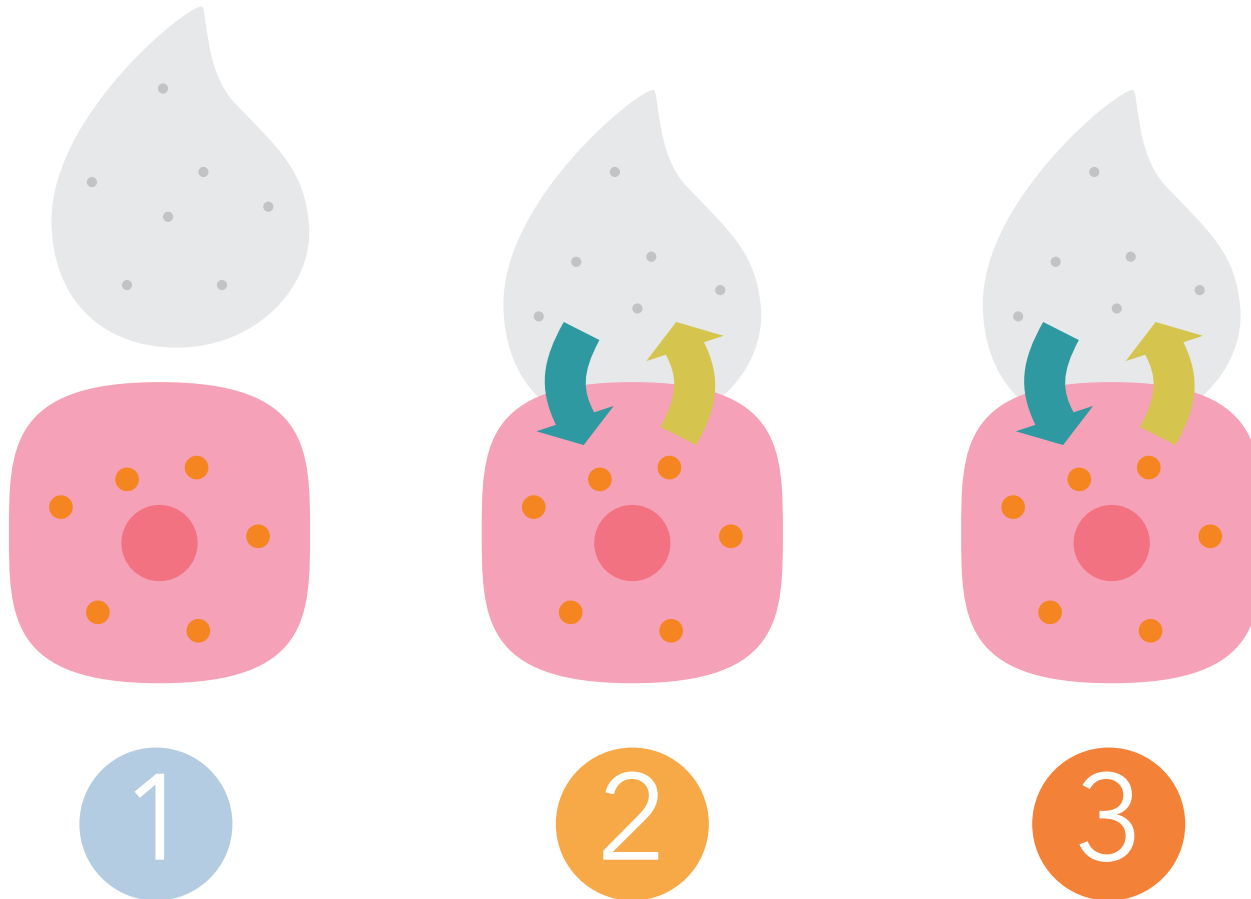
# OSMOLALITY

The measure of dissolved particles per unit of water in a solution, measured in mOsm/kg.

The osmolality of a lubricant is **important** because the epithelial layer and the body's natural mucus are constantly trying to maintain an equilibrium of water pressure; water flows freely through the cell walls of non-keratinized epithelium and mucus.

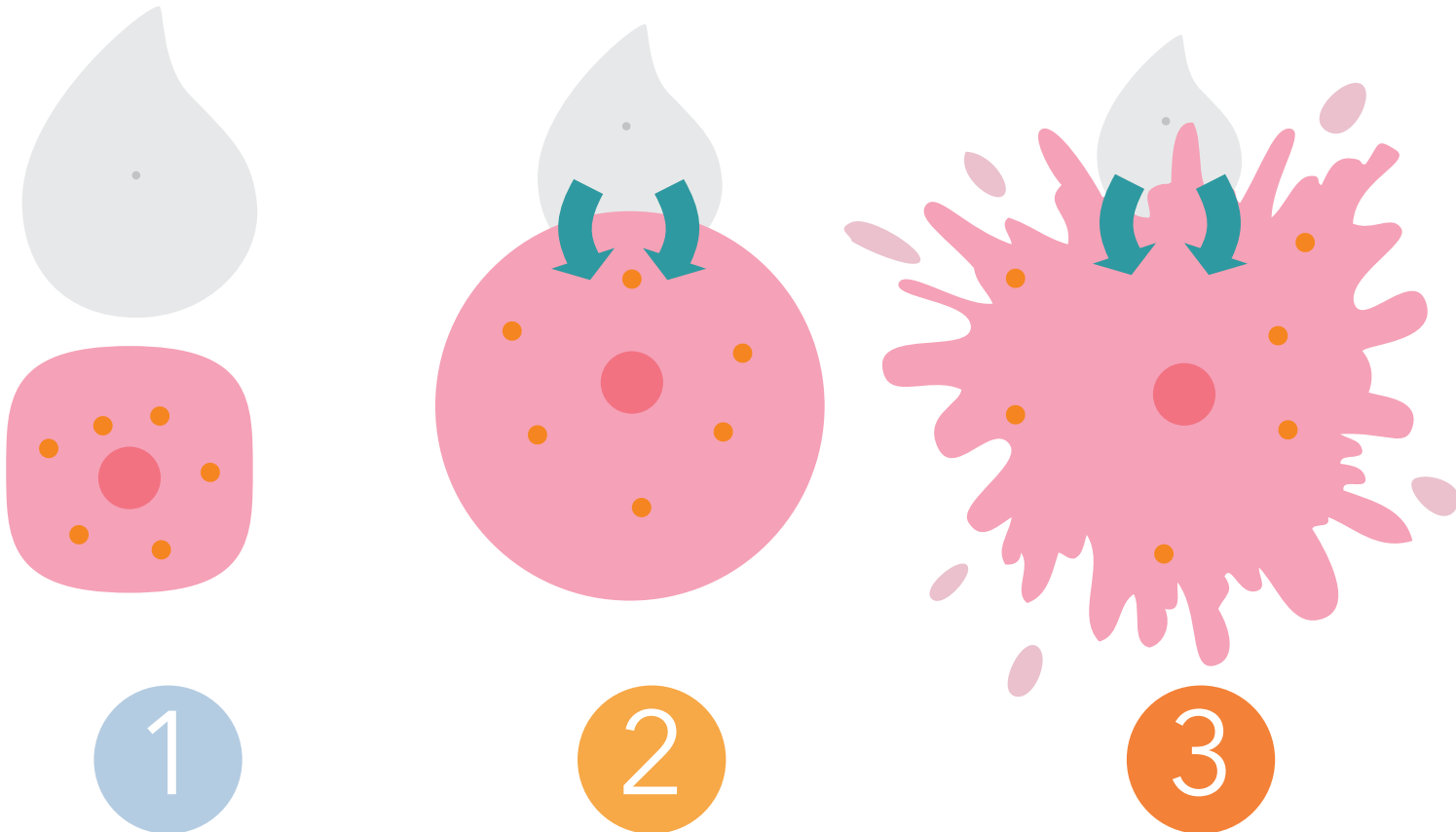
## ISO-OSMOTIC LUBRICANT

The lubricant has **a similar osmolality** to the cells of the mucous membrane.



## HYPO-OSMOTIC LUBRICANT

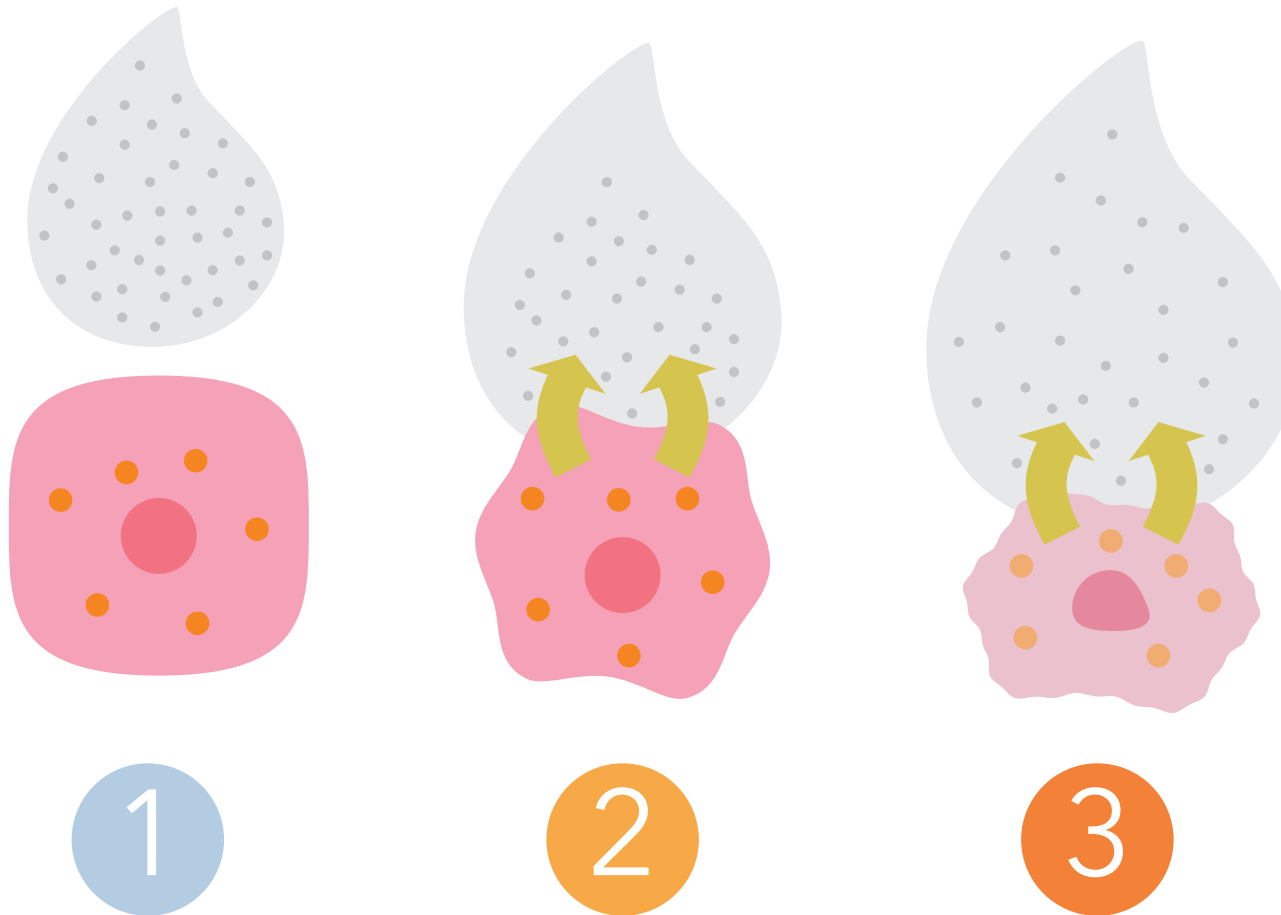
The lubricant has **a lower osmolality** than the cells of the mucous membrane.



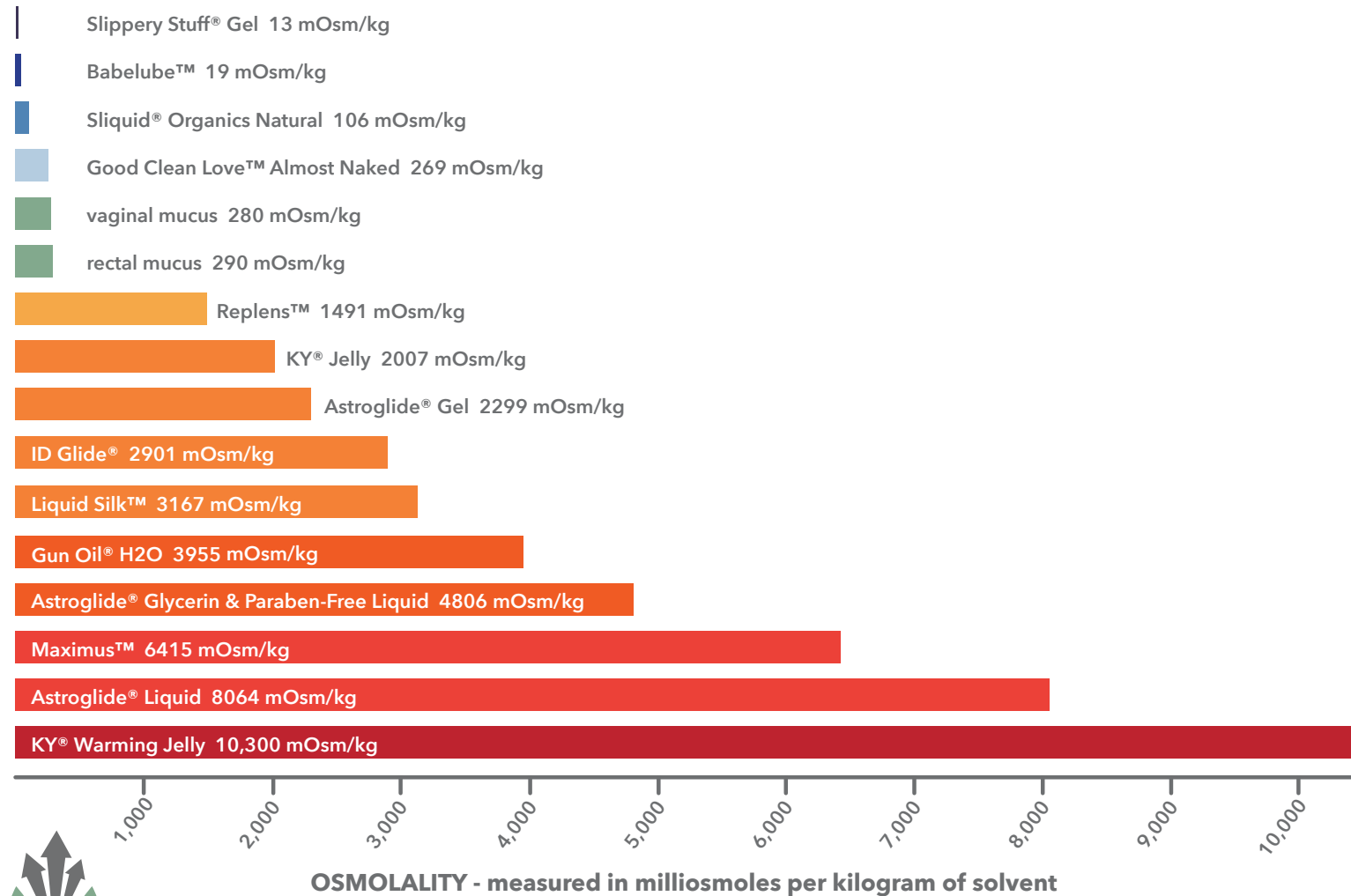


## HYPER-OSMOTIC LUBRICANT

The lubricant has a **higher osmolality** than the cells of the mucous membrane.



# OSMOLALITY OF WATER BASED LUBRICANTS



©2015 Smitten Kitten

Smitten  Kitten®  
www.smittenkittenonline.com

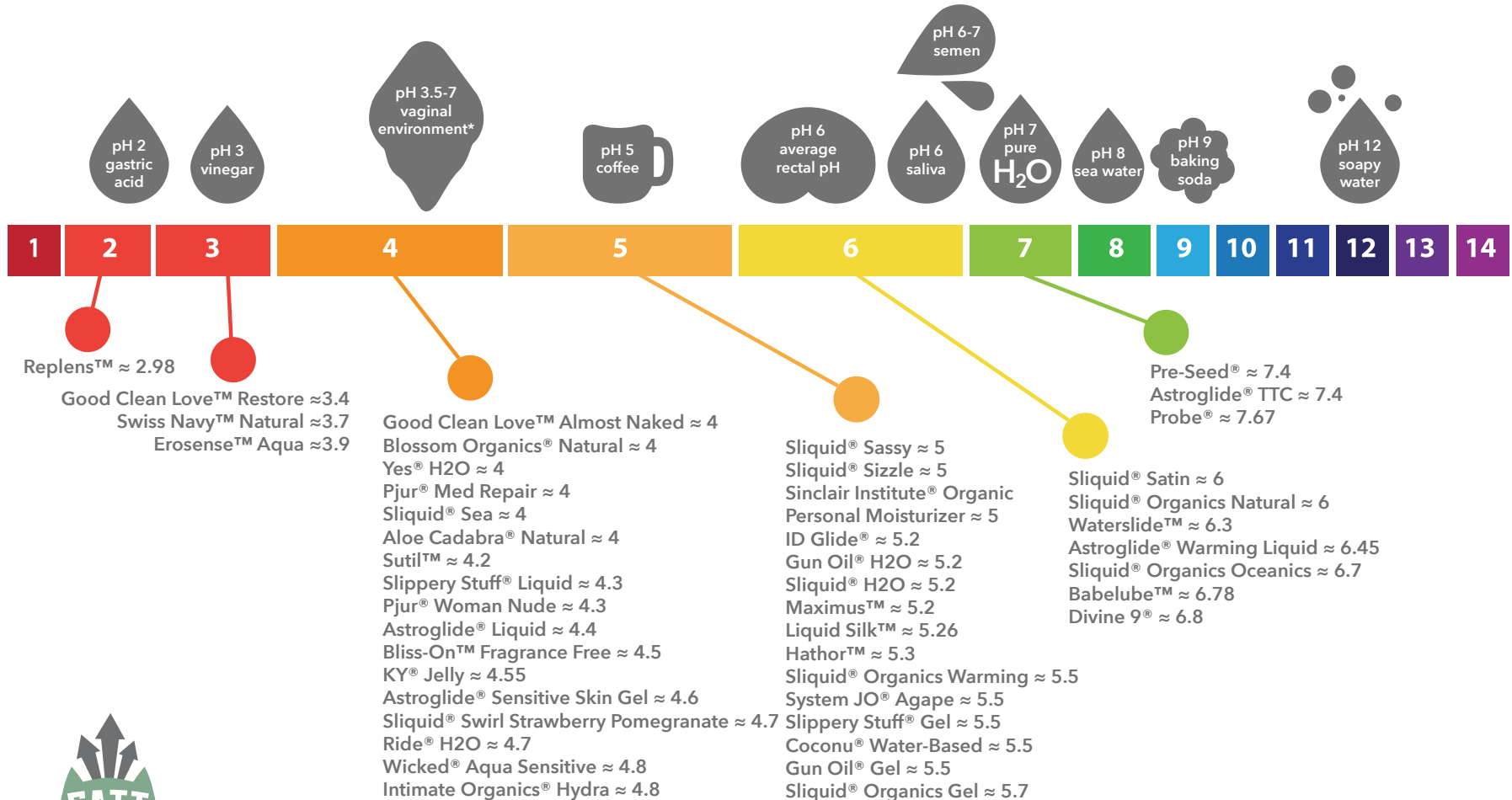
## World Health Organization Advisory Note:

"Most commercial personal lubricants have high osmolalities (2000-6000 mOsm/kg)... the normal osmolality of female vaginal secretions is 260-290 mOsm/kg and in human semen it is 250-380 mOsm/kg... **Ideally, the osmolality of a personal lubricant should not exceed 380 mOsm/kg to minimize any risk of epithelial damage....** It is therefore recommended on an interim bases that procurement agencies should source lubricants with osmolalities of not greater than 1200 mOsm/kg."

-World Health Organization. (2012). Use and procurement of additional lubricants for male and female condoms: WH.

# pH LEVELS OF WATER BASED LUBRICANTS

\*The range of "normal" vaginal pH is far greater than what has traditionally been understood. Vaginal pH varies widely in relation to hormonal levels and different bacterial populations, and the range stated here accounts for normal pH fluctuations that happen over a menstrual cycle and throughout life. A higher pH correlates to lower estrogen. A pH higher than 4.5 has often been seen as an indicator of bacterial vaginosis -- however, recent studies<sup>1</sup> have shown that most people with vaginas can regularly experience relatively high vaginal pH without the occurrence of BV.



©2015 Smitten Kitten

<sup>1</sup>Cone, Richard A. "Vaginal microbiota and sexually transmitted infections that may influence transmission of cell-associated HIV." Journal of Infectious Diseases 210.suppl 3 (2014): S616-S621.

Smitten Kitten  
[www.smittenkittenonline.com](http://www.smittenkittenonline.com)

## Ingredients To Watch Out For

Glycerin(e)

Propylene Glycol

Nonoxynol 9

Chlorhexidine Gluconate

Petroleum Oils

Polyquaternium-15

Benzocaine

Sugars

## Other Common Irritants

### PRESERVATIVES

Parabens  
Sodium Hydroxide  
Potassium Sorbate  
Benzyl Alcohol  
Diazolidinyl Urea  
Nonoxynol-9  
Chlorhexidine Gluconate  
Citric Acid  
Polyquaternium-15

### PETROCHEMICALS

Propylene Glycol  
Butylene Glycol  
Ethylenes  
Petroleum  
Mineral Oil

### SURFACTANTS

Sulfates  
Glycols  
Nonoxynol 9  
PEGs  
Polyquaterniums  
Chlorhexidine Gluconate

### FRAGRANCES AND FLAVORS

Honey  
Maltodextrin  
Menthol  
Essential Oils



©2015 Smitten Kitten



## Lube & Preexisting Health Conditions, Behaviors & Allergies

Certain behaviors, predispositions, and health conditions make people more vulnerable to the potential negative effects of lubricants...

- Frequency of use
- STI status
- Safer sex barrier use
- Cancer treatment  
(surgery, radiation therapy, and/or chemotherapy)
- Menopause & Post menopause
- Dermatitis
- Diabetes
- Kidney Disease
- Chronic skin conditions
- Chronic pain and/or inflammatory conditions
- Seasonal allergies and/or anaphylaxis

## REGULATION & LABELING

Currently, the FDA regulates some personal lubricants in two categories:



Medical  
Devices

Condom  
Safe



## REGULATION & LABELING

Organic Certifications are given by a variety of agencies with different criteria:

- USDA certification of an entire product requires 85% or more of the content of that product is USDA certified organic
- Individual ingredients in a largely nonorganic product maybe USDA certified as organic, and that product can advertise and label using the USDA certification seal
- Use of the terms "natural" or "organic" on labeling or marketing DO NOT indicate a product is entirely, or even partially organic
- "Organic" NEVER indicates a product is hypoallergenic, or is necessarily healthy for the genitals

## QUESTION TIME!

Ask me  
all your  
questions!

THANK YOU!



©2015 Smitten Kitten



Art by Jacqui Boyum & Hannah Jorden

## SOURCES (1/3)

Bakhshi, Rahul P. et al., "Hyperosmolar Sexual Lubricant Causes Epithelial Damage in the Distal Colon: Potential Implication for HIV Transmission." *The Journal of Infectious Disease*. 195 (2007):703-710. Web.

Begay, O., Jean-Pierre, N., Abraham, C. J., Chudolij, A., Seidor, S., Rodriguez, A., ... & Fernández-Romero, J. A. (2011). Identification of personal lubricants that can cause rectal epithelial cell damage and enhance HIV type 1 replication in vitro. *AIDS research and human retroviruses*, 27(9), 1019-1024.

Brotman, Rebecca M., et al. "Microbiome, sex hormones, and immune responses in the reproductive tract: challenges for vaccine development against sexually transmitted infections." *Vaccine* 32.14 (2014): 1543-1552.

Campo, Vanessa Leiria, et al. "Carrageenans: Biological properties, chemical modifications and structural analysis—A review." *Carbohydrate Polymers* 77.2 (2009): 167-180.

Caruso, Salvatore, et al. "Do hormones influence women's sex? Sexual activity over the menstrual cycle." *The journal of sexual medicine* 11.1 (2014): 211-221.

Chatterjea, Devavani, et al. "Mast cell degranulation mediates compound 48/80-induced hyperalgesia in mice." *Biochemical and biophysical research communications* 425.2 (2012): 237-243.

Chatterjea, Devavani, and Tijana Martinov. "Mast cells: versatile gatekeepers of pain." *Molecular immunology* 63.1 (2015): 38-44.

Cone, R. A., Hoen, T., Wong, X., Abusuwwa, R., Anderson, D. J., & Moench, T. R. (2006). Vaginal microbicides: detecting toxicities in vivo that paradoxically increase pathogen transmission. *BMC infectious diseases*, 6(1), 90.

Cone, Richard A. "Vaginal microbiota and sexually transmitted infections that may influence transmission of cell-associated HIV." *Journal of Infectious Diseases* 210.suppl 3 (2014): S616-S621.

## SOURCES (2/3)

Connor, Cody J., and Erin E. Eppsteiner. "Vulvar contact dermatitis." *Proceedings in Obstetrics and Gynecology* 4.2 (2014): 1-14.  
Dezzutti, C. S., Brown, E. R., Moncla, B., Russo, J., Cost, M., Wang, L., ... & Rohan, L. C. (2012). Is wetter better? An evaluation of over-the-counter personal lubricants for safety and anti-HIV-1 activity. *PLoS One*, 7(11), e48328.

Dezzutti, Charlene S., et al. "Development of HIV-1 Rectal-Specific Microbicides and Colonic Tissue Evaluation." *PloS one* 9.7 (2014): e102585.

Doncel, Gustavo F., and Meredith R. Clark. "Preclinical evaluation of anti-HIV microbicide products: new models and biomarkers." *Antiviral research* 88 (2010): S10-S18.

Fernández-Romero, José A., et al. "Preclinical assessments of vaginal microbicide candidate safety and efficacy." *Advanced drug delivery reviews*(2014).

Fuchs, E. J., Lee, L. A., Torbenson, M. S., Parsons, T. L., Bakshi, R. P., Guidos, A. M., ... & Hendrix, C. W. (2007). Hyperosmolar sexual lubricant causes epithelial damage in the distal colon: potential implication for HIV transmission. *Journal of Infectious Diseases*, 195(5), 703-710.

Gajer, Pawel, et al. "Temporal dynamics of the human vaginal microbiota." *Science translational medicine* 4.132 (2012): 132ra52-132ra52.

Lessmann, Holger, et al. "Skin-sensitizing and irritant properties of propylene glycol." *Contact dermatitis* 53.5 (2005): 247-259.

Martinov, Tijana, et al. "Contact hypersensitivity to oxazolone provokes vulvar mechanical hyperalgesia in mice." *PloS one* 8.10 (2013): e78673.

Moench, Thomas R., et al. "Microbicide excipients can greatly increase susceptibility to genital herpes transmission in the mouse." *BMC infectious diseases* 10.1 (2010): 331.

## SOURCES (3/3)

Nicole, W. (2014). A Question for Women's Health: Chemicals in Feminine Hygiene Products and Personal Lubricants. Environmental health perspectives, 122(3), A70.

Oronsky, B. T., Oronsky, N. C., & Oronsky, A. L. (2008). U.S. Patent Application 12/140,086.

Prajapati, Vipul D., et al. "Carrageenan: a natural seaweed polysaccharide and its applications." Carbohydrate polymers 105 (2014): 97-112.

TOXICOLOGY, OF. "Final Report on the Safety Assessment of Polyquaternium-10."

Turpin, Jim A. "Topical microbicides to prevent the transmission of HIV: formulation gaps and challenges." Drug delivery and translational research 1.3 (2011): 194-200.

Wang, Lin, et al. "Rectal microbicides: clinically relevant approach to the design of rectal specific placebo formulations." AIDS research and therapy 8 (2011): 12-12.

Wira, Charles R., et al. "REVIEW ARTICLE: Sex Hormone Regulation of Innate Immunity in the Female Reproductive Tract: The Role of Epithelial Cells in Balancing Reproductive Potential with Protection against Sexually Transmitted Pathogens." American journal of reproductive immunology 63.6 (2010): 544-565.

Wolf, L. K. (2012). Studies raise questions about safety of personal lubricants. Chem Eng News, 90(50), 46-47.

World Health Organization. (2012). Use and procurement of additional lubricants for male and female condoms: WH.