

# “Aroma Incredibellous,,

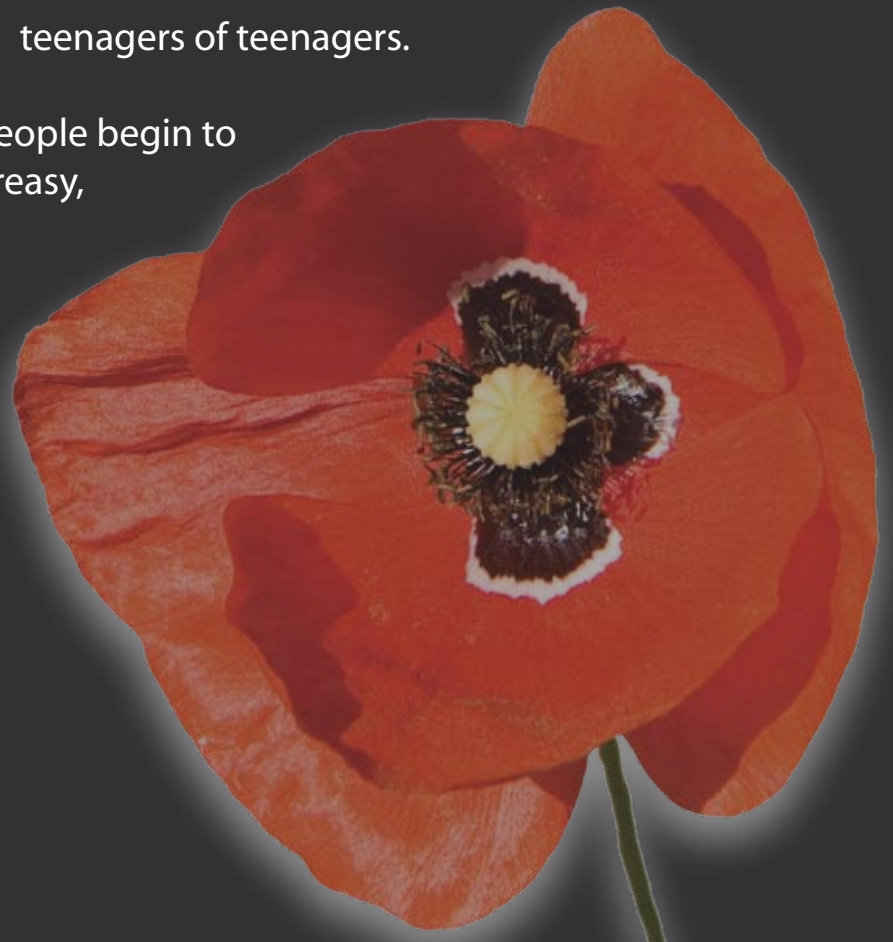
Every person has body odour, to a greater or lesser degree.

But there's one smell that no-one seems willing to talk about, let alone tackle body odour of old people.

Throughout our lifetimes, body odours are continuously evolving.

Babies smell of babies, and teenagers of teenagers.

But in middle to old age, people begin to produce an unpleasant greasy, grassy odour .



**This book, by practising pharmacists, gives you the information and the confidence to 'clear the air'**

**ENJOY LIFE AND ALLOW THOSE AROUND YOU ENJOY IT TOO!**

## ***Why do old people smell 'old'?***

To appreciate this we must first understand why everybody smells.



There's a layer of warm air that immediately surrounds our body.

It is called the **human thermal plume**. This plume originates at the top of your feet, swirls and rises, gathering speed and increasing

in volume, staying with you as you move through the day and ascending the length of your torso until it flows from the top of your head.

As the air moves up and away from you, dead cells (also known as rafts), body secretions and bacteria that were present on your skin's surface can also be carried upward. The warm air currents carry these loaded rafts into the surrounding area depositing your odour in the environment.

'***Aroma incredibellous***' was coined in the 60's for a radio ad. It may sound an overkill but if you are concerned with how you smell, read on.

Body odour affects all of us, men and women, to almost the same extent. We should be concerned about how we smell because people judge how we take care of ourselves by our smells and use this information to decide on how to interact with us.

Body odour results from a natural process involving sweat. Everybody sweats. We have to. Sweating is the body's biological way of cooling down. Sweating also helps excrete toxins from your body.

Skin flora consists of micro organisms that serve as a defence system to protect against negative influences. Zestz DeO has an active pH balance and contains the right ingredients to fight odour without affecting the natural functions of the skin. Zests DeO is effective against ageing odour.

## ***Body odour***

A review by the HOE Pharmacal Consultancy Panel of Pharmacists

---

## ***Manufacturing Body Odour the Chemistry of Body Secretions***

The human skin serves several functions, including regulating body temperature and excretion. The skin comprises three layers: epidermis, dermis and subcutaneous tissue. The dermis layer contains most of the specialized excretory glands and up to five million secretory glands including eccrine, apocrine, and sebaceous glands.<sup>27</sup>

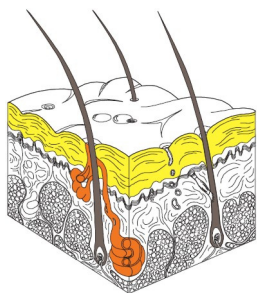
- **Eccrine glands**, which are active from birth, are present on the entire body surface and are particularly abundant on the palms of the hands and soles of the feet.<sup>1,2</sup> Eccrine sweat is typically composed of 98 percent water, but it also contains small amounts of **proteins, amino acids, lactic acid and urea**.<sup>3</sup> Eccrine glands play a major role electrolyte balance and thermoregulation by evaporative heat loss.<sup>4</sup>

- **Apocrine glands** are located only on genital, axillary and mammary areas, where they are always connected to a hair follicle.<sup>4</sup> Apocrine glands contain **lipids, proteins, ammonia, steroids and reducing sugars**.<sup>3</sup>

- **Sebaceous glands** occur over the entire body surface, including eyelids, ears, nostrils, lips, and nipples. This placement is particularly handy, as the secretions of these glands kill potentially dangerous microorganisms. Sebaceous glands produce secretions called sebum, which consists of **glycerides, free fatty acids, wax esters, squalene, and cholesterol**. These keep skin supple and waterproof and, on the downside, cause acne.

The wide variety of organic compounds found in the sebum can be influenced by a person's diet and genetics. The hydrolysis of human sebum results in the formation of a mixture of fatty acids, and the amount of free fatty acids in sebum can vary but averages between 15 to 25 percent.<sup>27</sup>

The skin of an adult covers about 1.5 to 2 square metres. With a weight of nearly 7 kilograms, the skin accounts for about 15% of your total body weight. That makes skin the largest human organ. Per cm<sup>2</sup>, approximately 100 sweat glands, 3,000 nerve endings, 1 meter of vessels and 3 million cells work for human health and well-being. No need to mention why good skin care is important.



Zests effectively prevents body odour under tropical conditions without impairing the natural function of the sweat glands

## **But what about the stench?**

When it's fresh, **sweat is sterile** and does not have much of an odour.

Sweat changes the acidic pH of the skin to alkaline. This high pH disrupts the **natural protective acid mantle** that keeps in balance the 'good' and the 'bad' bacteria in the microbial flora of our skin.<sup>10</sup> The 'bad' bacteria multiplies and increases the release of various enzymes, which promote the **breakdown of odourless sweat, sebum and dead cells** on your skin or on your clothing. These breakdown products are the cause of the "noxious fumes" that keep deodorant manufacturers in business.<sup>11,12</sup>

The following factors make the axillary (i.e., armpits and genital areas) regions good odour-producing areas in the human body<sup>7,8</sup>:

- The contents of the apocrine gland secretions may serve as **bacterial substrates**.
- Moisture is available from the eccrine glands create an environment ripe for **bacterial overgrowth**.
- There is a **resident** population of **bacteria** to transform nonodorous to **odiferous** substances.
- The presence of axillary hair may aid in the dispersion of the odour.<sup>28</sup>

Unfortunately, there are sufficient nutrients in the proteins, amino acids, lactic acid and urea from the eccrine and sebaceous glands to interest these **nasty** bacteria too. This explains the occasional **stench** of stale sweat wafting from your back in spite of the perfume you are wearing. Eccrine secretion helps spread the odiferous apocrine sweat and contribute further to the individual **human thermal plume**.

When **sweat gets onto clothes**, bacteria can also grow there, making the clothes smelly too.

Eccrine sweat softens keratin in your feet, palms and the intertriginous surfaces. Bacterial degradation of the keratin also yields a **foul smell**.



[tell.fill.purdue.edu/.../Medical/sweat.gif](http://tell.fill.purdue.edu/.../Medical/sweat.gif)

Triethyl citrate is widely used in cosmetic, pharmaceutical and food applications. Tirethyl citrate, in Zestz DeO ,gently acidifies the skin's pH with a time-release of citric acid.

## *Your Signature Odour*

Some people sweat buckets, and others generate little perspiration. Not only do we perspire differently, but the odour we emanate is individually specific, just like our appearance. Body odours are also characterised by age groups, such as babies, young people, and senior citizens. This **odour individuality** can be used to identify people, though this is more often done by dogs than by humans.

Human body odour consists of various odour components. Studies examining the volatile components have detected the presence of fatty acids, alcohols, ketones, aldehydes, esters, ethers, hydrocarbons, and other substances in body odour.<sup>11,12</sup> Odour individuality can be due to the slight differences in the overall composition of this mix.<sup>13</sup>

### *Many factors influence body odour composition*

Odour similarity of twins<sup>21</sup> and other relatives, and differences in underarm sweat among people with differing ethnic backgrounds<sup>29</sup> suggest that odour individuality (i.e., odour signature) is to some extent under **genetic control**.

**Psychophysiological influences** exert a confounding impact on body odour composition. Body odour changes across women's menstrual cycle, peaking in attractiveness around the time of ovulation<sup>22, 23, 24</sup>. Your mood (e.g., fear, anger) may influence your body odour<sup>25</sup>.

**Environmental factors** shaping odour signature are numerous and include eating habits, smoking, using drugs, medicals, some diseases, and infections.<sup>19,20</sup>

### *Who are affected?*

Typically young children do not have a strong body odour because their oil glands are not producing the oils that bacteria on the skin process to create typical adult body odours. This occurs shortly before the onset of **puberty**.

At puberty, sweat glands develop under the stimulation of **hormones and protein**. Oil production by the skin in the armpits and genital areas also increases. Body odour may then become a problem, especially if hygiene is poor.

And **Gen-Xs and Baby Boomers**, the fatty acid composition of skin surface lipids changes as we grow older. Bacteria work on this change to produce ageing odour, the **unpleasant and greasy odour** of old-age.

At last, this can be controlled with Trehalose, a unique compound found in a wide variety of resurrection plants

## ***Let's clear the air on the need for medical attention***

Medical diagnosis isn't usually necessary. But if you are sweating excessively, I mean really profusely, you may need the attention of your medical practitioner:

- **Menopause.** Women going through menopause may experience hot flashes — a rise in temperature accompanied by sweating and a feeling of intense heat — due to a drop in estrogen levels.
- **Low levels of male hormones.** Men with low levels of the male hormone testosterone or a condition known as hypogonadism can have hot flashes too.
- **Low blood sugar** is most common in people with diabetes who take insulin or oral medications that enhance the action of insulin. Early signs and symptoms include sweating, shakiness, weakness, hunger, dizziness and nausea. Some people may develop low blood sugar after eating, especially if they've had stomach or intestinal surgery. In rare cases your body may produce too much insulin, leading to low blood sugar.
- **Fevers.** You may have a fever with many types of bacterial and viral infections. When your body temperature finally begins to return to normal, known as "breaking of the fever," you may sweat profusely, which is your body's way of dissipating the excess heat. Shaking chills after the fever are your body's attempt to raise its core temperature. Repeated episodes of fever followed by sweating may indicate a serious infection or other illness.
- **Heart attack.** This occurs when a loss of blood supply damages or destroys part of your heart muscle. The signs and symptoms of a heart attack include pressure; fullness or squeezing pain in your chest that lasts for a few minutes or pain that extends beyond your chest to your shoulder, arm or back; shortness of breath; and intense sweating. If you experience these symptoms, get immediate medical care. Every minute counts after a heart attack.
- **Tuberculosis.** Among its signs and symptoms are a cough, slight fever and night sweats. When left untreated, tuberculosis can be fatal.

**Do you know.....**

### **Men sweat 40% more than women**

because they have higher testosterone levels -- testosterone influences apocrine sweat production

Zestz contains citronellyl methylcrotonate, a lemon grass extract, to neutralise body odour

## ***Let's clear the air on the need for medical attention***

- **Overactive thyroid** can cause a number of signs and symptoms, including weight loss, a rapid or irregular heartbeat, nervousness and increased sensitivity to heat. It may also cause you to perspire much more than normal.
- **Malaria.** Malaria is an infectious disease which affects millions of people worldwide. It is characterized by cycles of chills, fever, pain and sweating. These cycles are related to the life cycle of the parasite, Plasmodium that causes malaria.
- **Certain types of cancer.** Leukemia and lymphoma can produce unusual sweating patterns.

### ***You should also talk to your doctor***

if you notice a change in body odour.

- **A fruity smell,** for example, may be a sign of diabetes.
- **An ammonia smell** may be associated with kidney or liver disease.
- **A rotting-fish smell** – A rare inborn error of metabolism associated with an offensive body odor, the smell of rotting fish, due to the excessive excretion of trimethylaminuria (TMA) in urine, sweat, and breath.

To the huge majority out there who do not need to see a doctor, please remember that you interact with other human beings everyday. Clearly, there is a lot at risk if one has body odour since man is a gregarious animal and bad body odour can make him unable to maintain or even start relationships.



### ***Enjoy life, and let those around you enjoy it too!***

***Just a brief note to commend you for your remarkable product...  
Nothing I've ever used has been so effective in eliminating  
this old-man odour. Thanks again!"*** ***NCH Port Klang***

*You turn 40 and begin to realise you smell differently*

## **Your Ageing Odour**

Even your clothes smell. Your regular deodorant/antiperspirant that used to work fairly well is unable to cover the unpleasant odour of “old oil”, “old soap” or “wet grass” emanating from your body.

The generous splashing of cologne or after-shave cannot cover your increased body odour either and only complicates the already foul situation with an overpowering tertiary odour

***90% of Japanese women think middle-aged men stink***

Young women in particular have recently become hypersensitive to body odours of the older generation. They ranked this odour second, after bad breath, as the odour people are most concerned about

**Every person has body odour**, to a greater or lesser degree but what actually causes this strange odour?

## ***The strange smell in middle-aged and elderly people explained!***

Although the many components of body odour were unaffected by age, once a person hits 40, the volume of palmitoleic acid, a fatty acid from the sebaceous glands, rises sharply.<sup>12,13,14,15</sup> It can go up to 10 times as great among people in their seventies as in their forties.

Over time, this fatty acid is broken down by bacteria inhabiting the skin or by lipid peroxides (which are present in larger quantities in older people), producing an unsaturated aldehyde 2-nonenal.

It's 2-nonenal that is responsible for that unpleasant greasy and grassy odour.

***Now young women don't turn away because of my old-book odour ....but I still have to work on my inter-personal skills ; ) LMH Teluk Pulai***

Trehalose is present in a wide variety of plant and animal life enabling survival at the extremes of temperature and dehydration.

## ***Tackling Nasty BO***

## **Body odour is often easily managed.**

### ***Here are 7 simple tips:***

#### **1. Shower regularly, but don't overdo it!**

Showers regularly to remove sweat and reduce the number of odour-causing bacteria from the surface of the skin.

A shower in the morning and when you get home is usually good enough. Make sure to wash after any sports/sweaty activity.

If you sweat a lot, you may need to shower more often.

Showering means washing your hair, too. Greasy hair smells anything but fresh.

Use a pH balanced soap-free cleanser on all areas of your body, particularly your armpits, groins and feet.

Dry thoroughly after shower with a clean towel; it defeats the purpose of showering if you dry off with a filthy towel.

#### **2. Change regularly!**

Always wear clean clothes. Just accept that you are someone who can't get a two-day wear out of a shirt — maybe pants, it depends on the person.

When sweat gets onto clothes, bacteria can also grow there, making the clothes smelly too. The same applies to our undergarments and socks.

Loose fitting clothes allow air to circulate around the body, allowing perspiration to evaporate. Wear natural fibers next to the skin, such as cotton, wool and silk, which allow the skin to breathe. Wash your clothes often, and then dry these as quickly as possible. Bacteria can survive in damp clothing and produce a characteristic smell.

#### **3. You Are What You Eat**

Dietary components shape our body odour. Your sweat glands have to help get rid of various by-products from the food you consume. In a test involving 17 male donors it has been shown that odour of donors when on the non-meat diet was judged by a panel of 30 women as significantly more attractive, more pleasant, and less intense.<sup>26</sup>

So limit your intake of red meat and also food containing garlic, onion, chilli, pepper, vinegar, blue cheese, cabbage, radish, fermented milk products, and marinated fish.<sup>25</sup>

Eat whole grains, massive quantities of leafy vegetables, fresh fruits, soy products, supergreens, lots of sprouts, raw nuts and seeds, healthy oils and other similar healthful ingredients.

Eat enough fiber. A diet low in fiber may cause constipation, which can contribute to body odour.

## ***Tackling Nasty BO***

## ***Simple Tips continued***

### **4. Take Regular Exercise**

By sweating during exercise, you can rid your body of toxins, bacteria and fungi. Sweating also flushes away the more odiferous apocrine sweat. It is important that you shower after a workout. This destroys the breeding ground for the odour causing bacteria and keeps you feeling fresh.

### **5. Chill Out**

Consider relaxation techniques such as yoga, meditation or biofeedback. These can help you learn to control the stress that triggers perspiration.

### **6. Don't Smoke**

Smoking dulls the senses of smell and taste, so you won't know if something else about you smells bad to others.

### **7. Good Foot Hygiene** to reduce bacteria and sweating to low levels:

- Bathe your feet daily in lukewarm water with a mild soap paying particular attention to the toe web.
- Always wipe between the toes to remove excess moisture. Dust your feet with a foot powder, if necessary.
- Wear natural fibre socks such as wool or cotton to help absorb the moisture. Change your socks at least once a day
- Wear shoes that are made of leather, canvas, mesh or other materials that allow the feet to breathe. Its is best not to wear the same pair of shoes two days in a row - they need time to dry out

I know they seem like a lot, but really, once you incorporate these 7 simple steps into your schedule, they seem like secondhand nature.

***“For me, it was quite a liberating experience. I did not even realize all the ways that these odours affected my life- all the little things that I did, the situations I avoided, all to prevent from being embarrassed by my odour.” A. Yam, Klang***

In order to keep skin healthy, body care products have to respect the skin barrier.

## **Tackling Nasty BO**

### **Deodorants and Antiperspirants**

A modern deodorant is expected to perform several tasks at the same time: It should provide **long-lasting, all-day protection** while imparting a feeling of **freshness and cleanliness**, and should also be **skin-compatible and mild**.

Let's first consider the conventional deodorants and antiperspirants.

#### **1. Deodorants**

Most deodorants are scented to overpower the odour of sweat rather than hiding it. This is akin to the **public toilet** where the smell of urine, faeces and sweat is masked with the overpowering scent of cherry. When the **masking effect** wears off, the malodour becomes noticeable again, often more intensely.

A heavy perfume can be just as obnoxious as body odour. More than this, the wake of the ghastly odour can trigger migraine and headache attacks in susceptible people around you.<sup>1</sup>

#### **2. Antiperspirants**

Sweating can be delayed with certain aluminum compounds. Studies have shown that aluminum salts cause an obstruction of the sweat gland ducts at the skin's surface. It seems that the metal ions combine with proteins, damaging cells along the wall of the duct and forming a plug that blocks sweat output. Sweat is still produced, and may appear as prickly heat ("miliaria") during heat stress, with sweat building up behind the obstruction created by the metallic salt.

The effects of these products are not permanent and they must be applied on a regular basis to maintain the therapeutic effect.

Antiperspirants are not always preferred in a body odour control product since, when used over the entire body, they may **interfere** with the **body's thermal regulatory process**.

Thus, it is clear that the problem of odour inhibition has by no means been completely solved. Compounding this problem is the unique ageing odour associated with people aged 40 years and above. Current products are unable permanently to suppress the secretion of perspiration or the formation of odour. Instead, their inhibiting effect is of limited duration and is also dependent on the extent to which perspiration is secreted.

**In the next three pages** we will show you how we have successfully addressed these problems with a careful blend of skin friendly ingredients,

- without recourse to indiscriminate killing of skin bacteria.
- without suppressing the physiological function of sweating.

# Zestz DeO Spray

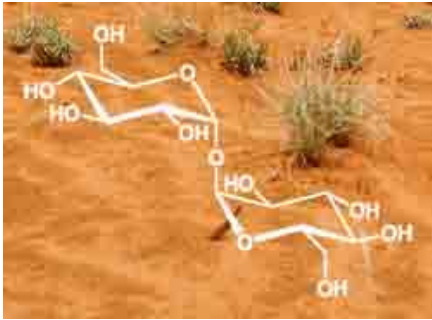
## A must for the 40+

Pharmacist refined and tested blend of skin friendly actives

### 1. Trehalose inhibits foul-smelling aldehydes

Body odour changes as a person age. Dr Shoji Nakamura of the cosmetics giant **Shiseido** has discovered the substance that makes **middle-aged people smell**. It is called 2-nonenal, an unsaturated aldehyde with a greasy, grassy odour; people over the age of 40 develop it but young people do not have it. 2-nonenal is the oxidation product of palmitoleic acid in the fatty acid composition of skin surface lipids.

**Trehalose** is a naturally disaccharide that has the ability to inhibit radical formation in palmitoleic acid thereby preventing its decomposition into malodourous 2-nonenal.<sup>3</sup>



One of the fascinating aspects of trehalose is its presence in a wide variety of plant and animal life enabling survival at the extremes of temperature and dehydration.

Thus Trehalose is able to protect skin fibroblast from dehydration because it replaces water in tissues, helping to retain the natural structure of the skin. This skin moisturizing action in **Zestz DeO Spray** is a **bonus** for the ageing skin.

### 2. Starving odour-causing bacteria

Fresh sweat has no odour. But bacteria **feed on our excretions**, especially in the warm, damp axillary vaults, and produce malodorous molecules as a byproduct.

To counter this, deodorants typically contain high levels of bactericides, like triclosan. However, **indiscriminate** action against all 'good' and 'bad' bacteria can distort the **ecological balance** of the resident bacterial flora on your skin. This is undesirable as the skin's natural microbial flora is the first barrier against disease.

By starving the bacteria that cause nasty body odour, a **sustained deodorant** effect might be achieved without recourse to bactericidal action. Studies have shown that this **nutrient deprivation** can be achieved with common pharmaceutical excipients; thus the careful blend of these simple excipients in **Zestz DeO Spray**.

Body odor "strikes" when you could least afford it.

# Zestz DeO Spray

## *Essentially for the 40+*

More pharmacist refined and tested blend of skin friendly actives

### 3. Triethyl citrate maintains protective acid mantle

Triethyl citrate, widely used in cosmetic, pharmaceutical and food applications, helps maintain the protective acid mantle of the skin for a sustained cycle of body odour control. Here's how it goes about its unique role:

- a. Sweating changes the acidic pH of the skin to alkaline. This high pH disrupts the bacterial flora on your skin causing the 'bad' bacteria to multiply. 'Bad' bacteria increase the release of various enzymes, which promote the breakdown of sweat, sebum and dead cells on your skin and on your clothing.
- b. These same esterase enzymes hydrolyse triethyl citrate to release citric acid. Citric acid lowers the pH value of skin to its natural level. The fall of pH deactivates the esterase enzymes, preventing the breakdown of body secretions. The acidic pH also restores the ecological balance of 'good' and 'bad' bacteria on your skin.
- c. The action of triethyl citrate goes on for a long time, since its degradation to citric acid is not immediate and complete, but it takes place only when the rising skin pH is not able to inhibit the esterase enzyme. At this point a part of triethyl citrate is converted to citric acid, just sufficient to lower again the pH and restart the cycle.

### 4. Citronellyl methylcrotonate neutralises malodours



When you enter a public restroom and smell the overpowering scent of cherry, you've been exposed to a masking agent. **Odour masking superimposes** one malodour on another stronger odour, thereby creating a fragrant version of the malodour and most often at higher level of **odour intensity**. When the masking effect wears off, the malodours become noticeable again. While removing odour, masking agents may even introduce hazardous compounds to you.

**Citronellyl methylcrotonate**, a derivative of natural citronella, reduces the intensity of malodours without itself possessing any significantly intense odour or fragrance. It **neutralises malodours** and making it unavailable for the olfactory senses to pick up. **So what you smell is.... Nothing!**

In order to keep skin healthy, body care products have to **respect the skin barrier**

# Zestz DeO Spray

## *Unrivalled Odour Control and Moisturisation*

### PRODUCT FEATURES

- Intelligent deodorisation - prevents body and ageing odours without harmful chemicals and metal derivatives
- Does not impede the physiological functions of the sweat glands
- pH value of 5.5 supports natural ecological system of the skin for natural deodorising protection
- Long-lasting freshness and protection for living, breathing skin
- Designed especially for the 40+ who are concerned about their increased body odour.
- No harsh scent to clash with your choice of fine perfume!

### DIRECTIONS

Use immediately after a shower. **Spray liberally** on body and on relevant parts of **clothing**. Upon drying it leaves the skin smooth and conditioned and ready to **tackle the challenges of a hectic day!**

The added moisturisers and the lowest possible alcohol concentration produce extremely good tolerance rates with simultaneous care function. For this reason, **Zestz Deo Spray** is appropriate for sensitive or irritated skin.

Stimulated by the natural perspiration process of your skin, **Zestz Deo Spray** with active pH levels provides sustained extra protection and freshness. Its pleasant hint of tea tree oil does not confound the fragrance of the perfume, cologne or after-shave that you wear.

### INGREDIENTS

Water, Isopropanol, Coceth-7/PPG-1-PEG-9 Lauryl Glycol Ether/PEG-40 Hydrogenated Castor Oil, Triethyl Citrate, Trehalose, Phenoxyethanol, Melaleuca Alternifolia (Tea Tree) Leaf Oil, Citronellyl Methylcrotonate, Disodium Edetate, Butylated Hydroxytoluene, Sodium Citrate

### PACKING

75ml spray pump bottle

### CAUTION:

FOR EXTERNAL USE ONLY. Avoid contact with eyes. Do not ingest. Do not apply to broken or irritated skin. To test for sensitivity, spray a small amount on the inside of your forearm and wait 24 hours. Discontinue use immediately if rash, irritation or discomfort develops. Consult your doctor or pharmacist if irritation persists. Keep out of reach of children.

***Enjoy life, and let those around you enjoy it too!***  
**[Click here to order](#)**

## CLINICAL REFERENCES

1. Groscurth P. Anatomy of sweat glands. *Curr Probl Dermatol*. 2002;30:1-9.
2. Hölzle E. Pathophysiology of sweating. *Curr Probl Dermatol*. 2002;30:10-22.
3. Blackburn, D.G. (1991) Evolutionary origins of the mammary gland. *Mamm. Rev.* 21, 81–96
4. Scrivener Y, Cribier B. Morphology of sweat glands. *Morphologie* 2002 Mar;86(272):5-17.
5. Sato K, Sato F. Sweat secretion by human axillary apoeccrine sweat gland in vitro. *Am J Physiol*. 1987;252:R181-R187.
6. Stoddart, D.M. (1990) *The Scented Ape: the Biology and Culture of Human Odour*, Cambridge University Press
7. Kanda F, Yagi E, Fukuda M, Nakajima K, Ohta T & Nakata O. Elucidation of chemical compounds responsible for foot malodour. *Br J Dermatol* (1990) 122: 771–776.
8. Zeng XN, Leyden JJ, Lawley HJ, Sawano K, Nohara I & Preti G. Analysis of characteristic odors from human male axillae. *J Chem Ecol* (1991) 17: 1469–1492.
9. Stenzaly-Achtert S, Schölermann A, Schreiber J, Dieck KH, Rippke F, Bielfeldt S. Axillary pH and influence of deodorants. *Skin Res Technol* 2000 May; 6(2) :87-91
10. James AG, J. Casey J, D. Hylands D & Mycock G. Fatty acid metabolism by cutaneous bacteria and its role in axillary malodour. *Biomedical and Life Sciences* 2004 November; 20(8)
11. Bernier UR, Kline DL, Barnard DR, Schreck CE & Yost RA. Analysis of human skin emanations by gas chromatography/mass spectrometry. 2. Identification of volatile compounds that are candidate attractants for the yellow fever mosquito (*Aedes aegypti*). *Anal Chem* (2000) 72: 747–756
12. Ellin RI, Farrand RL & Oberst FW et al. An apparatus for the detection and quantitation of volatile human effluents. *J Chromatogr* (1974) 100: 137–152.
13. Nicolaides N. Skin lipids: their biochemical uniqueness. *Science* (1974) 186: 19–26.
14. Nazzaro-Porro M, Passi S, Boniforti L & Belsito F. Effect of aging on fatty acids in skin surface lipids. *J Invest Dermatol* (1979) 73: 112–117.
15. Green SC, Stewart ME & Downing DT. Variation in sebum fatty acid composition among adult humans. *J Invest Dermatol* (1984) 83: 114–117.
16. Haze S, Gozu Y, Nakamura S, Kohno Y, Sawano K, Ohta H & Yamazaki K. 2-Nonenal Newly Found in Human Body Odor Tends to Increase with Aging. *Journal of Investigative Dermatology* (2001) 116, 520–524.
17. Ara K, Hama M, Akiba S, Koike K, Okisaka K, Hagura T, Kamiya T, Tomita F. Foot odor due to microbial metabolism and its control. *Biological Science Laboratories, Kao Co., Ltd., Tochigi 321-3497, Japan*
18. Landa AS and Makin SA. Iron sequestration on skin: a new route to improved deodorancy. *International Journal of Cosmetic Science* (2003); 25(3)
19. Senol M & Fireman P. Body odor in dermatologic diagnosis. *Cutis* (1999) 63: 107–111.
20. Labows JN. Human odors. *Perf Flavor* (1979) 4: 12–17.
21. Wallace P. 1977. Individual discrimination of human by odor. *Physiol Behav* 19:577–9
22. Thornhill R, Gangestad SW, Miller R, Scheyd G, McCollough JK, Franklin M. 2003. Major histocompatibility complex genes, symmetry, and body scent attractiveness in men and women. *Behav Ecol* 14:668–78;
23. Kuukasja rvi S, Eriksson CJP, Koskela E, Mappes T, Nissinen K, Rantala MJ. 2004. Attractiveness of women's body odors over the menstrual cycle: the role of oral contraceptives and receiver sex. *Behav Ecol* 15:579–84;
24. Havlicek J, Roberts SC, Flegr J. 2005. Women's preference for dominant male odour: effects of menstrual cycle and relationship status. *Biol Lett* 1:256–9.
25. Chen D, Haviland-Jones J. 2000. Human olfactory communication of emotion. *Percept Mot Skills* 91:771–81. Ackerl K, Atzmueller M, Grammer K. 2002. The scent of fear. *Neuro Endocrinol Lett* 23:79–84.
26. Havlicek J, Lenochova P, The Effect of Meat Consumption on Body Odor Attractiveness. *Chem. Senses* 31: 747–752, 2006
27. Ramotowski, R. S. Composition of latent print residue. In: *Advances in Fingerprint Technology*, 2nd ed. H. C. Lee and R. E. Gaensslen, eds. CRC, Boca Raton, Florida, 2001, pp. 63-104.
28. Van Toller, S. and Dodd, G. H. eds. *Perfumery: Psychology and Biology of Fragrance*. Chapman and Hall, London, 1988.1. Groscurth P. Anatomy of sweat glands. *Curr Probl Dermatol*. 2002;30:1-9.
29. Sommerville, B. A. and Gee, D. Research on body odours: New prospects for combating crime? *I.C.P.R. (1987):18-22.*