



IJPPR

INTERNATIONAL JOURNAL OF PHARMACY & PHARMACEUTICAL RESEARCH
An official Publication of Human Journals

ISSN 2349-7203



Human Journals

Review Article

March 2021 Vol.:20, Issue:4

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A Review – New Generation Capsule Sanitizers



IJPPR
INTERNATIONAL JOURNAL OF PHARMACY & PHARMACEUTICAL RESEARCH
An official Publication of Human Journals



ISSN 2349-7203

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Submitted: 01 February 2021
Revised: 21 February 2021
Accepted: 11 March 2021

Keywords: Gelatin, Alcohol, Plasticizer, Colour, Opacifier

ABSTRACT

Hand Sanitizer also called antiseptic, hand rubs, or hand rubbing agent applied to the hands to remove common pathogens (disease-causing organism). Hand sanitizers typically come in foam, gel, or liquid form. Nowadays COVID-19 is a new illness and a big threat to global health. No specific antiviral agents are available for this treatment. The only way to prevent this virus is hand sanitization by soap or sanitizers. But in killing viruses, microorganisms and bacteria sanitizers are most effective. This study aims to show the importance, uses of the Capsule hand sanitizers can be used for killing virus & microorganism, it is easy for us. It is also effective in killing viruses, microorganisms & bacteria. The present study was undertaken as the new strategy to develop the hand sanitizer effectively.



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INTRODUCTION:

By using Hand Sanitizer reduces the microbial counts and kills many harmful germs that could infect workers with the flu and other viruses. To keep the workplace a healthy and thriving environment, employers must take into account the health of their employees. It kills microbial cells. It is based on the percent isopropanol alcohol, which is rubbing alcohol. That is the concentration of rubbing alcohol that is most effective in killing germs-. Sanitizers are more effective in Hospitals when hands are in contact with germs. Nowadays Capsule Sanitizers can also help in protecting from viruses, microorganisms & bacteria. Capsule sanitizers are easy to use and are more portable. Various ingredients are involved in formulating the capsule sanitizers such as alcohol, Agar gel, Aloe-vera gel, and this all is then mixed with hand sanitizers and various essential oils are added later as a flavoring and for the nourishment on the skin which helps in preventing the skin from irritation and various side effects.

COVID-19 is a new illness and a big threat to global health. No specific antiviral agents are available for its treatment. The finest approach to manage this threat is to clean our hands properly. Washing hands under running water is a better way to stop the spread of infections than using a hand sanitizer. [1, 2]

Hand sanitizers are more effective in hospitals when hands are in contact with germs, but not soiled or greasy. Other studies also reveal that hand sanitizers might be effective on lubricated hands with certain microbes. When hands are heavily soiled or greasy, for example, after playing outdoor games, gardening, fishing, traveling, executing extension activities such as campaigning, and in certain cases, hand sanitizers may not be effective. In such circumstances, washing hands with soap and water is always preferable. Sanitizers cannot remove soil, dirt, and lubrication rather they will make hands sticky, attracting more dirt.

As there is a need for the advanced development of hand sanitizer in the current scenario. Capsule hand sanitizer is the best approach for the same. Capsule hand sanitizers can be used for killing viruses & microorganisms, it is easy for us. It is also effective in killing viruses, microorganisms & bacteria. So with the help of the capsule hand sanitizer, one can easily sanitize the hands without the aid of water. [3]

Materials Used to prepare soft gelatin capsule

The capsule shell is composed of gelatin, plasticizer, and water. It may contain additional ingredients such as preservatives, colouring agents, opacifying agents, plasticizer, and medicaments to achieve the desired effect.

Role of Ingredients

Gelatin: It is a protein obtained by partial hydrolysis of collagen, the chief protein component in skin, bone, hides, and white connective tissue of the animal body. Because it is obtained from collagen by controlled partial hydrolysis and does not exist in nature, gelatin is classified as a derived protein. [4]

Water: Not more than 45% w/w. The ratio by weight of water to dry gelatin can vary from 0.7 – 1.3 (water) to 1.0 (dry gelatin) depending on the viscosity of the gelatin being used.

Plasticizer: Used to make soft gell shell, elastic and pliable (easily bent). The ratio used is between 0.3 – 1.8 for soft to hard shells on a dry basis. E.g. Glycerin, Sorbitol.

Colour: Colour used in the shell must be darker than the color of encapsulating material color may be natural or synthetic. The dark color dyes can be used as they will absorb the heat generated due to friction and hence will provide quick onset of action by dissolving (melting) rapidly.

Opacifier: Usually titanium dioxide may be added to produce an opaque shell when the film formulation is a suspension or to prevent photo-degradation of light-sensitive fill ingredient. [5]

Direction to Use?

- When there is the unavailability of soap and water.
- When hands are not soiled and non-hygienic and are greasy too.
- When coming in direct touch with patients, sanitize hands.
- Before wearing sterile gloves and after disposing of too sanitize hands.
- Before inserting a central intravascular catheter, sanitize hands.

- Before the procedures which do not require surgery such as before inserting indwelling urinary catheters, peripheral vascular catheters, or other invasive devices, sanitize hands.
- When measuring the body temperature or pulse or blood pressure, and addressing a patient, sanitize hands. [6]

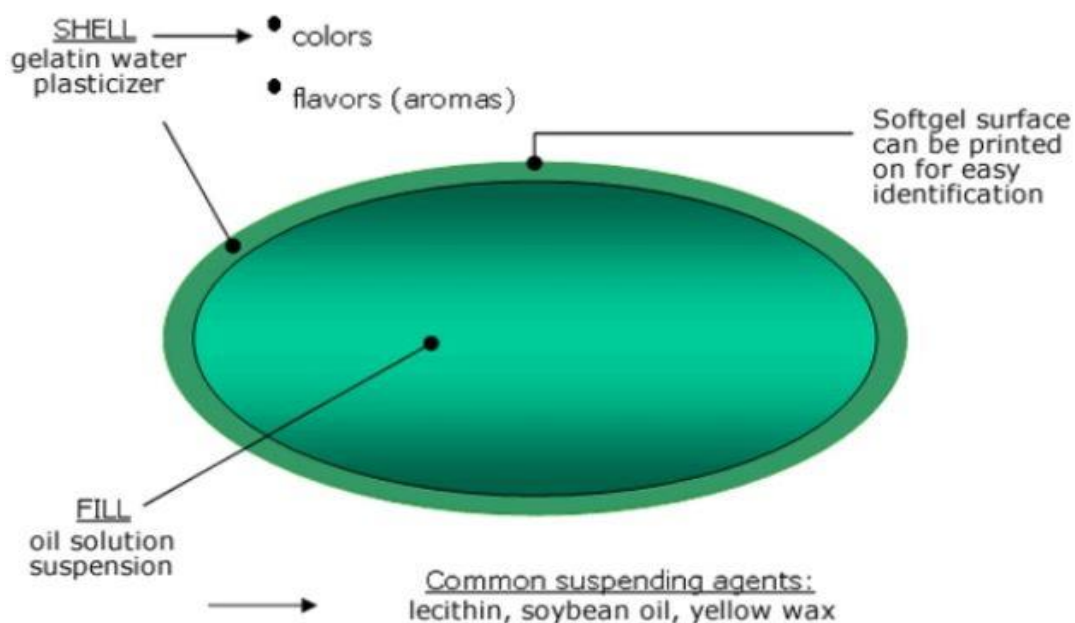


Figure No. 1: Soft Gelatin Capsule Shell [7]

Table No. 1: Role of Plasticizer in various Conditions. [8]

Hardness	The ratio of Dry Glycerin/Gelatin	Uses
Hard	0.4/1.0	Hot-Humid area
Medium	0.6/1.0	Temperature area
Soft	0.8/1.0	Cold dry area



Figure No. 2: Soft Gelatin Capsule. [9]

Method of Preparation

Plate process: The plating process is a technique that you can use in making Soft gel capsules. It is the simplest and easiest technique among all the techniques of Soft gel encapsulation.

Rotatory die process: Two plasticized gelatin ribbons are continuously and simultaneously fed with the liquid or paste fill between the rollers of the rotary die mechanism where the capsule is simultaneously filled, shaped, hermetically sealed, and cut from the gelatin ribbon.

Reciprocating Die process: The reciprocating die process is almost the same as the rotary die process.

The main difference between the two processes is:

The reciprocating die process uses reciprocating back and forth die.

The rotary die process uses the rotary round and round die.

Accogel Machines

The Accogel capsule machine is the only machine that can fill powder inner fill materials into the capsule shells. Implying that the Accogel process involves the encapsulation of dry powder inner fill materials. You will mix all the dry ingredients of forming the dry powder inner fill material separately. In that case, you will fill the inner fill tank of the accogel machine with dry powder. The machine will form the gelatin capsule shells using the same

process as that of the rotary die process. After that, the machine will fill the gelatin capsule shell with the powder inner fill material. [10]

Advantages of soft gelatin capsules

1. Soft gelatin capsules provide a patient-friendly dosage form for peroral administration of non-palatable and/or oily liquids.
2. Solutions or suspensions with an unpleasant odor or taste can be easily ingested in a soft gelatin capsule dosage form, which offers a tidy appearance and convenient ingestion.
3. The proper choice of vehicle may promote rapid dispersion of capsule contents and drug dissolution.
4. Capsule hand sanitizers are durable, ready to use, and can be formulated with the help of seaweeds found in the seawaters.
5. Seaweeds are the red algae found under the sea, these are also compound products that are available in edible ones also, which can be added to our food as nutraceuticals.

Disadvantages of soft gelatin capsules

1. Moisture-sensitive drugs may not be stable in soft gelatin capsules due to the relatively higher water content in the soft gelatin shell (20–30% w/w).
2. The use of soft gelatin capsule shell imposes significant limitations on the drug formulations that can be encapsulated in this dosage form, that is, restricted to liquids and semisolids.
3. Capsule hand sanitizers are expensive as compared to liquid or gel hand sanitizers.
4. Capsule shell may get deteriorate due to the interaction between the alcohol and shell.
5. The manufacturing process is relatively tedious and difficult to optimize (e.g., ribbon thickness, fill weight, and weight variation). Also, the breakage of even one capsule during the manufacturing can lead to the coating of drug formulation on the outer surface of several other capsules. This can also happen during storage in multiple-use containers, such as high-density polyethylene (HDPE) bottles. [11]

CONCLUSION:

Proper hand hygiene is one of the essential infection control strategies as it can undeniably lower the likelihood of direct or indirect transmissions of microorganisms. The use of ABHS is becoming more common because of their rapid action and efficiency in killing microorganisms, mainly when hand washing using soap and water is not practical or convenient. There are, however, some situations in which hand washing is preferred as ABHS are less effective when the hands are visibly dirty or stained and cannot cover certain kinds of pathogens. It is vital to select ABHS with the appropriate amount of alcohol and practice the correct hand hygiene technique when cleaning hands to ensure all the microorganisms are effectively killed.

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