ROSSERA

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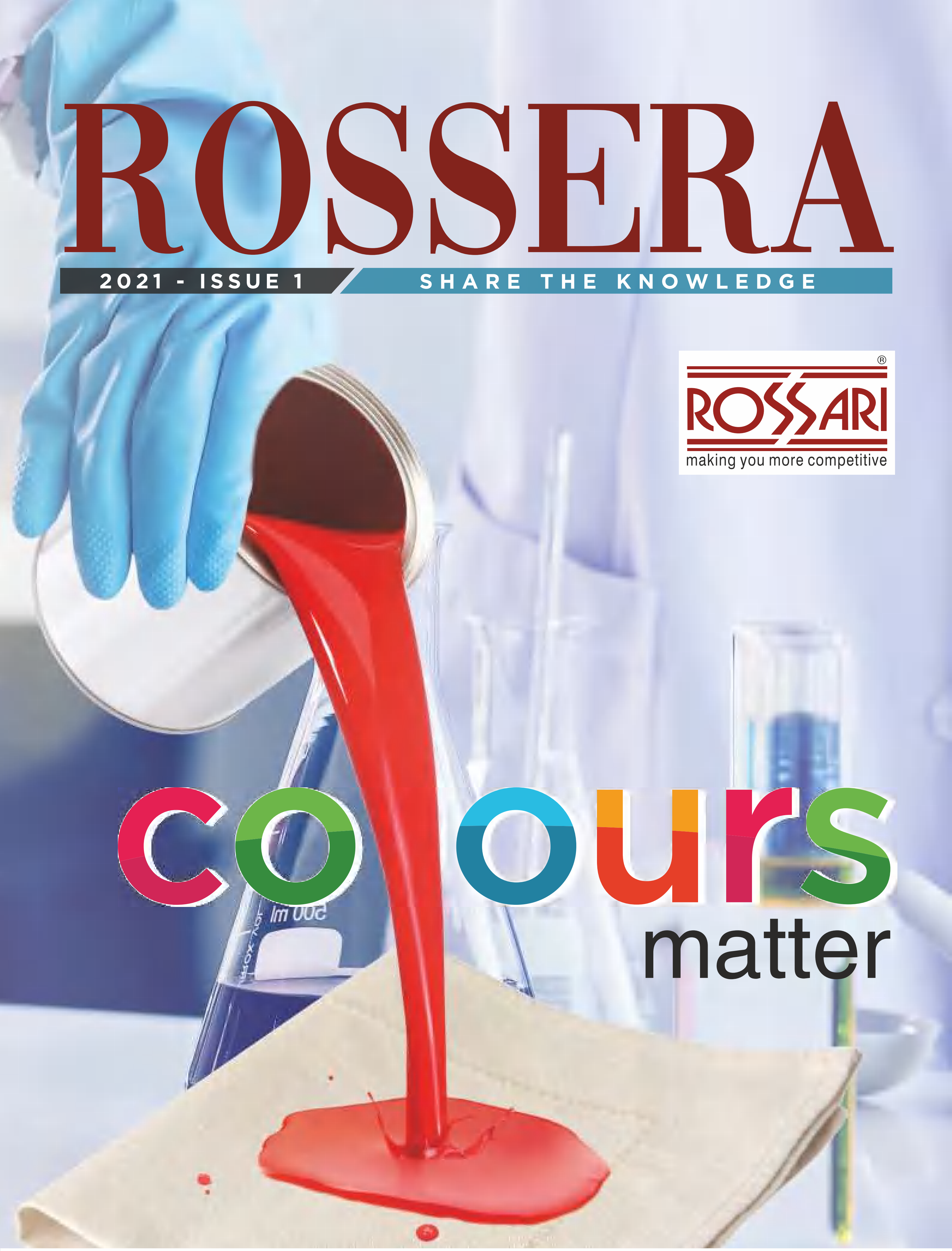

colours matter

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Mr. Sunil Chari

Managing Director

The Covid -19 pandemic has lead to challenging times .

In India, the pandemic hit the economy at a time when growth was already decelerating. But now business activity across the private sector is slowly expanding at a marked and accelerated pace, with growth picking up among manufacturers and service providers.

In India, growth is expected to recover to 5.4 percent in 2021, as the rebound from a low base is offset by muted private investment growth given financial sector weaknesses. The projected growth recovery this year follows a severe collapse in 2020 that has had acute adverse impacts. Economic growth is more likely to pick up in the second half of the year, which is also when we expect large advanced economies to have vaccinated a substantial share of their population.

The chemical industry also serves as a feeder for many other industries, which may play an important role in our economic revival. The industry is adapting to changing needs and modifying supply chains, catering to new demands. New opportunities have opened up for the chemical industry, with global supply chains looking to realign sourcing to mitigate future risks. By the end of 2021 or early 2022, we expect the Indian economy to revert to its pre-pandemic level of output.

Mr. Edward Menezes

Executive Chairman

Reactive dyes are the most predominant class of dyes for cellulosic today and the majority of cellulosic substrates are dyed with these dyes. They are also increasingly gaining importance for wool and polyamide fibres.

Reactive dyes are among the class of organic compounds that are primarily used for dyeing textiles. Reactive dyes possess properties to form covalent bonds with substrates that are to be colored, and they also form chemical bonds with fiber, which is the main component of cotton fibers.

In a reactive dye, a chromophore (an atom or group whose presence is responsible for the colour of a compound) contains a substituent that reacts with the substrate. Reactive dyes have good fastness properties owing to the bonding that occurs during dyeing. Multi-functional reactive anchor systems have been a part of textile colouration for many years.

Rosazol, Rosafix, and Rosareact branded Reactive Dyes from Rossari Biotech Limited are versatile dyes that can be used in a variety of colouration processes including Warm Exhaust, Hot Exhaust, Cold Patch Batch Dyeing, Pad Dye Thermofix among others. With good colour reproducibility and fastness properties, these offer the gamut of colour for textile dyeing.

NATURAL YET UNSUSTAINABLE

Looking good and feeling nice is a basic need for the social human being. The colour and design of clothes we wear and the ambience of home office decor we live-in impact our mood and improves our comfort factor. Colours are associated with emotions, festivals, seasons and passion towards life.

The colouration of textiles is an age-old technique and essentially developed to make us appear more attractive, appealing and differentiating. The value addition in textiles is achieved through adequate colouration, which tends to improve product performance and satisfy consumer needs by enhancing aesthetic appeal.

Earlier, colourants were extracted from various abundantly available natural sources like - plants, animals and minerals. Historical as well as archaeological evidence indicates that the natural colours were used in dyeing, printing, and painting by primitive communities throughout the world and the use of natural dyes on textile material has been practised for over many centuries. Colourants bind with the textile material through a chemical reaction or physical entrapment to achieve the desired extent of permanency and colour fastness properties. They are supplied in both solid and liquid form as powders, granules, solutions or dispersions.

With the advent of industrialisation, machinery development and need to meet growing demand from the global market, the requirement of mass production of Textile for apparel and clothing generated. This led to the innovation and development of synthetic dyestuffs and from the year 1856 after the synthesis of “Mauve” by William Perkin, began a new era of colouration technology.

Since then a fierce competition ensued among several European and Asian dyestuff manufacturers and resulted in the development of thousands of synthetic dyes and the manufacturing of millions of tonnes of these products.

The synthetic colourants are mostly based on fossil fuel and derived from crude oil. With a growing population and per capita usage of Textiles, the consumption of synthetic colourants have proportionately increased. The huge production and consumption of such colourants has resulted in the depletion of fossil fuel and posed a threat to the environment owing to the related hazards of toxicity, bioaccumulation, and pollution.

Under the growing global awareness about sustainable development, the negative impact of certain synthetic dyes due to their toxic and allergic reactions is a cause of major concern. For this reason, many countries proactively put a ban on certain synthetic dyestuffs which generates hazardous by-products and carcinogenic intermediates.

Off late, terms like sustainability, ecological footprint, green technology, etc are being widely used and the new generation is becoming increasingly aggressive towards conserving nature. This has prompted international brands to promote the use of natural products and off late, it is becoming fashionable to use terms like “going back to nature” or “giving back to mother earth”.

The natural dyes as such are nontoxic and less allergenic as compared to the synthetic dyes. Moreover, it has been established that some of the natural colourants also possess medicinal value. This has prompted academic as well as industrial researchers to study and if required modify certain natural colourants. The biodegradability and eco-friendly aspect of such colourants have revived the interest of international brands and environment-conscious global consumers towards the use of textiles dyed with natural dyes.

Natural colourants are obtained from many sources and are usually categorised

A: Based on their origin

Plant - from various parts - seeds, roots, trunks, barks, leaves, flowers, fruits etc. India has about 450 dye yielding plants.

Animal - from dry dead bodies of insects.

Mineral- from inorganic metal salts and metal oxides of the earth crust.

B: Based on the chemical class

Indigoid - the most important and the oldest dyes of this class are the royal Indigo and Tyrian purple well known for their excellent lightfastness.

Anthraquinone - the most popular dyes of this class are - Madder, Lac, Kermes and Cochineal.

Flavonoids - the largest set of dyes providing yellow colours - Jackfruit, Onion, Hemp, Kamala and Sandalwood.

Carotenoids - the brightly coloured organic pigments based on the presence of long conjugated double bonds - Annatto, Saffron, Curcuma longa .

Napthoquinones - the most significant and widely used dye of this class is Henna.

Quinonoids - these are abundantly available in nature - Sunflower, Walnut, Indian Madder and Gaudich are few examples.

C: Based on colour

Yellow - these constitute the largest category and hence commercially the most cost - effective dyes - Turmeric, Goldenrod, Marigold, Parijataka, ustic, Blackberry, Weld, Pomegranate Rind, Palas, Hazel, Saffron etc.

Red - these are the next most commonly obtained colourants and the popular ones are - Manjistha, Kusumbar, Safflower, Madder, Brazilwood, Lac, Cochineal, Kerm etc.

Blue - these are derived from - Water lily, Sunberry, Indigo, Woad etc.

Black - obtained from - Custard apple, Harda, Alder, etc.

Naturally, the natural dyes were meant for their application on natural textile fibers like - Cotton, Linen, Jute, Silk, Wool, etc. However, many of these colourants can also be applied to synthetic fibers like Nylon and Polyester. The commonly used application methods involve - exhaust dyeing in open width form or dip-dye, tie-n-dye methods to achieve certain dyeing and printing effects like - Bandhani, Batik, Kalamkari, Patola, Ikat, Ajrakh. In India, the use and application of natural colouration has survived the onslaught of industrial synthetic colourants and the rural artisans have preserved this traditional art form.

The natural dyes score over synthetic dyes based on below listed features.

Eco friendly - derived from a natural source and are biodegradable.

User friendly - non-toxic and non-allergic, even having therapeutic value.

Nature friendly - reduced carbon footprint based on renewable source.

Waste utility - sourced from waste materials of plants.

Labour friendly - cultivation, extraction and application provides employment opportunity to the people from the rural and suburban area.

Shade achievability - able to produce a wide gamut of shades from single colour by simply altering dye application techniques.

Aesthetic ability - shades produced are soft, lustrous and soothing to the human eye.

Although there are many advantages associated with the natural colourants in terms of ecological benefits, there are certain limitations which are equally important and need to be considered for adequate comparison with synthetic dyes.

The disadvantages and limitations of natural colourants are considered to be.

Availability - inconsistent and varies depending on season, place or source.

Land use - requires a large arable area for cultivation, reducing accessible land for food grains.

Water consumption - needs a large amount of water during cultivation as well as subsequent colour extraction.

Less productivity - the actual colour obtained is a small fraction of the large material source.

High waste - the large amount of leftover mass poses a problem for disposal.

Quality control - difficult to attain consistent quality and purity of extracted dyestuff as it varies with the source material.

Poor reproducibility - difficult to re-attain the same shade during repeated applications due to the number of complexing factors.

Non uniformity - achieving levelness of dyeing is a challenge and needs critical control over various application parameters.

Low strength - needs a large quantity of dyestuff owing to the limited tinctorial value.

Poor shade matching - recipe prediction is difficult as the dye is a mixture of multiple moieties which vary based on extraction, isolation and purification process.

Inferior colour fastness - significantly affected by external agencies like Sun, sweat water, air, etc.

Toxicity and hazards - the application of natural colourants involves use of mordants, usually based on metal salts or tannins which cause effluent pollution and hazard to human and aquatic life.

High Cost - owing to the low yield, tedious colour extraction process and the complicated dyeing application.

Considering all the above information related to the benefits as well as shortfalls of natural vis-a-vis synthetic colourants in terms of ecology, economy, performance efficiency and end-use fastness parameters, it is advisable to adopt a judicious approach towards advocacy of any specific or particular type of colourants keeping in mind that "Old is not necessarily Gold".

Demand for sustainable wet processing of textiles is growing rapidly, it essentially requires equal consciousness towards economic, social and environmental relevance of the processes and products used therein.

Stringent environmental regulations are imposed by many countries in response to the hazardous effluent generated during synthesis as well as the use of synthetic colourants. The toxic and allergic reactions associated with the synthetic dyes lead to the interest in the use of environmentally friendly natural dyes. Therefore, it is imperative to understand benefits as well as limitations of both the type of colourants and then judiciously consider the applicability of suitable products based on the end-use requirement.

SODIUM HYPOCHLORITE AS DISINFECTANT Part II

Introduction

Sodium hypochlorite (NaOCl) is a compound that can be effectively used for water purification. It is used on a large scale for surface purification, bleaching, odor removal and water disinfection.

Antimicrobial effect of sodium hypochlorite

The antimicrobial effectiveness of sodium hypochlorite, based in its high pH (hydroxyl ions action). The high pH of sodium hypochlorite interferes in the cytoplasmic membrane integrity with an irreversible enzymatic inhibition, biosynthetic alterations in cellular metabolism and phospholipid degradation observed in lipidic peroxidation.

The undissociated (nonionized) hypochlorous acid is believed to react with and inactivate bacterial and viral enzymes. Sodium hypochlorite is commonly used as a biocide in industrial applications to control slime & bacteria formation in water systems used at power plants, pulp and paper mills, etc. In solutions typically of 10–15% by weight.

Sodium hypochlorite is the medicament of choice due to its efficacy against pathogenic organisms and pulp digestion in endodontic therapy. Its concentration for use varies from 0.5% to 5.25%. At low concentrations it dissolves mainly necrotic tissue, at higher concentrations it also dissolves vital tissue and additional bacterial species.

Sodium hypochlorite is poisonous for water organisms. It is mutagenic and very toxic when it comes in contact with ammonium salts.

Disinfection

Sodium hypochlorite in solution exhibits broad spectrum anti-microbial activity and is widely used in healthcare facilities in a variety of settings. It is usually diluted in water depending on its intended use. "Strong chlorine solution" is a 0.5% solution of hypochlorite (containing approximately 5000 ppm free chlorine) used for disinfecting areas contaminated with body fluids, including large blood spills. It may be made by diluting household bleach as appropriate (normally 1 part bleach to 9 parts water). Such solutions have been demonstrated to inactivate both *C. difficile* and HPV. "Weak chlorine solution" is a 0.05% solution of hypochlorite used for washing hands, but is normally prepared with calcium hypochlorite granules.

Solutions containing more than 500 ppm available chlorine are corrosive to some metals, alloys and many thermoplastics (such as acetal resin) and need to be thoroughly removed afterwards, so the bleach disinfection is sometimes followed by an ethanol disinfection. Liquids containing sodium hypochlorite as the main active component are also used for household cleaning and disinfection, for example toilet cleaners. Some cleaners are formulated to be viscous so as not to drain quickly from vertical surfaces, such as the inside of a toilet bowl.

Use against *Clostridioides difficile* infection

Clostridioides difficile infection (CDI or C-diff), also known as *Clostridium difficile* infection, is a symptomatic infection due to the spore-forming bacterium *Clostridioides difficile*. Symptoms include watery diarrhea, fever, nausea, and abdominal pain

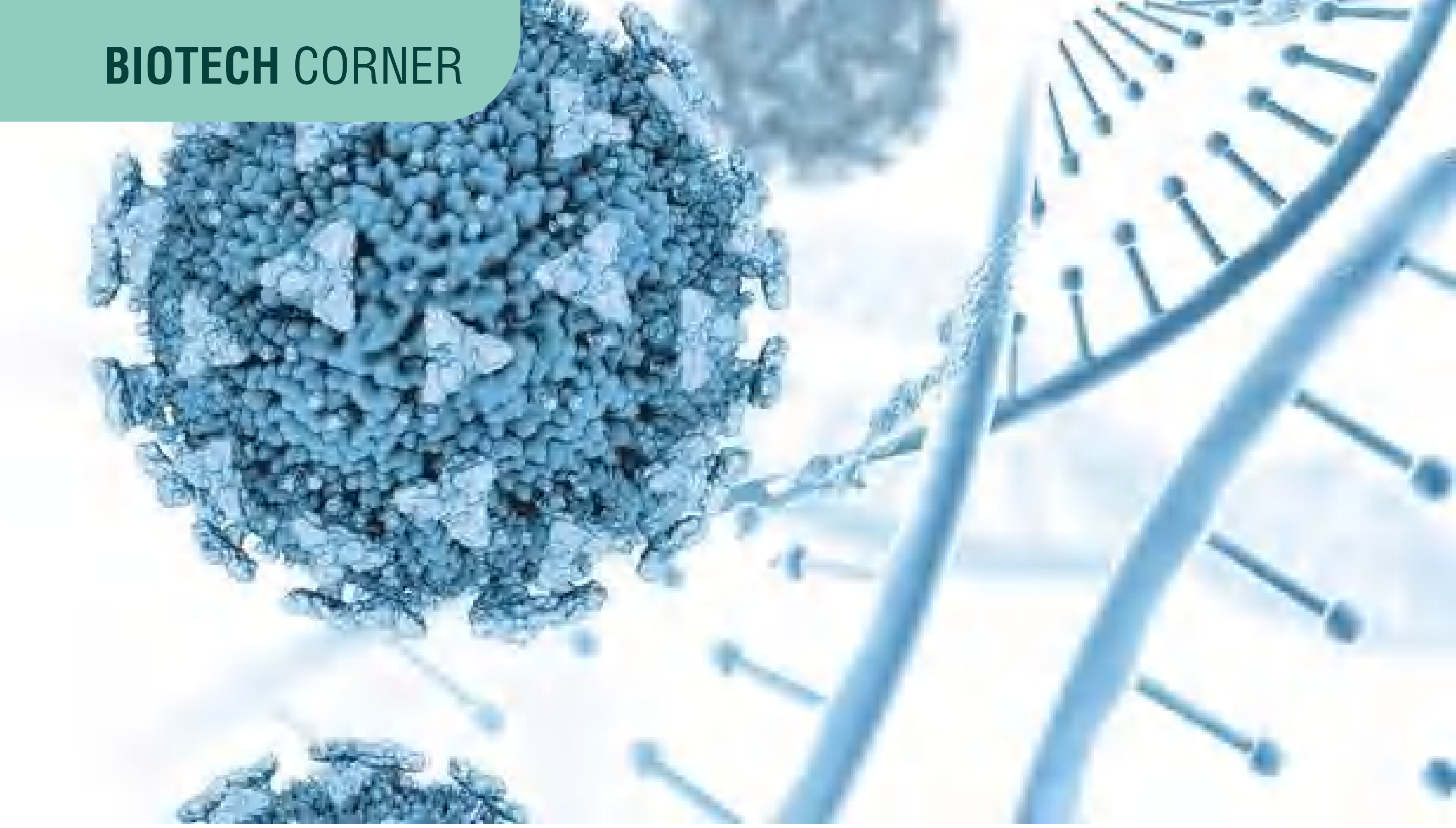
Infection control

Bleach wipes containing 0.55% sodium hypochlorite have been shown to kill the spores and prevent transmission between patients.

Common hospital disinfectants are ineffective against *C. difficile* spores, and may promote spore formation, but disinfectants containing a 10:1 ratio of water to bleach effectively kill the spores.

Use against human papillomavirus infection

Human papillomavirus infection (HPV infection) is an infection caused by the human papillomavirus (HPV). About 90% of HPV infections cause no symptoms and resolve spontaneously within two years. However, in some cases, an HPV infection persists and results in either warts or precancerous lesions. Nearly all cervical cancer is due to HPV.



Disinfection

The virus is unusually hardy, and is immune to most common disinfectants. It is the first virus ever shown to be resistant to inactivation by glutaraldehyde, which is among the most common strong disinfectants used in hospitals. Diluted sodium hypochlorite bleach is effective, but cannot be used on some types of re-usable equipment, such as ultrasound transducers.

Use against corona virus

Disinfectant tunnels have been installed at many places, and 0.5 % sodium hypochlorite solution is being used in the tunnel. The use of sodium hypochlorite, which is sprayed on people when they walk through a disinfectant tunnel, may have a harmful effect on them even if there is a slight variation in its concentration.

The tunnels through, which people walk while a mist of sodium hypochlorite solution, is sprayed on them to clear any viruses have been installed at various public places. Some of the tunnels are even using one per cent concentration of sodium hypochlorite.

There is no study so far which says that it is effective in killing the virus, which might be present on clothes or the human body. Hence, there are more chances of having harmful effects if it is sprayed on the body. As even a slight variation in the concentration of sodium hypochlorite may have harmful effects and people should instead take other preventive measures as wearing masks, washing hands frequently, to avoid contracting the virus.

The World Health Organisation (WHO) has also advised that bleach and disinfectant should be used carefully to disinfect surfaces only.

Health effects of sodium hypochlorite

There is no threshold value for sodium hypochlorite exposure. Various health effects occur after exposure to sodium hypochlorite. People are exposed to sodium hypochlorite by inhalation of aerosols. This causes coughing and a sore throat. After swallowing sodium hypochlorite the effects are stomach ache, a burning sensation, coughing, diarrhea, a sore throat and vomiting. Sodium hypochlorite on skin or eyes causes redness and pain. After prolonged exposure, the skin can become sensitive.

In Swimming pools the concentration of sodium hypochlorite that is found is generally not harmful to people. But when there is too much chlorine in the water, this burns the body tissues, which causes damage to air tracts, the stomach and the intestines, the eyes and the skin. It sometimes causes red eyes and it gives off a typical chlorine odor.

VETERINARY HEALTH AND WELFARE PLANNING

Although there is no 'one case fits all' strategy for all farms or integrations, a basic approach working as a partnership with a range of technical experts, stockmen and veterinarian scan develop an evolving biosecurity programme. This should be formalized as part of the farm veterinary health and welfare plan. This health plan should be seen as a working document that formalizes agreed actions and procedures. The plan should be a practical document that accurately reflects what is done at the farm level, how it is done, what the aims and targets are and how these will be audited.

In setting baselines and targets for such a programme it is essential to know which disease causing organisms are present in poultry stock at the breeder and commercial level. A programme should be in place to monitor this, so that the veterinarian and producer can be aware of what challenges are occurring but also to audit the success (or otherwise) of the biosecurity interventions. This is an example of a practical implementation of HACCP principles.

Monitoring and setting baselines
Effective disease monitoring may be achieved by:

Regular monitoring of all performance data on farm, including

- Mortality
- Culling rate
- Daily liveweight gain
- Evenness
- Food conversion ratio (FCR)
- European production efficiency factor (EPEF)
- Egg production
- Egg quality
- Fertility
- Hatchability

Assessment of processing plant data for levels of

- Carcass damage
- Reject rates and criteria
- Downgrading

Sampling and screening for disease-causing agents

Serology

- Monitor response to vaccination programme during a disease outbreak.
- Terminal bloods to check exposure to disease agents.
- Regular monitoring to confirm freedom from specific organisms.

Post-mortem examinations

- During a disease outbreak specific targeted lesion scoring (e.g. for subclinical coccidial challenge monitoring).
- To assess skeletal development.
- To screen for subclinical indications of disease, e.g. intestinal damage, presence of parasites, air sac damage.

Other samples

- Polymerase chain reaction (PCR) swabs for viral/bacterial antigen detection.
- Faeces for worm egg count, coccidial challenge, Salmonella spp., Campylobacter spp.
- Water - water quality testing.
- Tissues for virus isolation, residues of extraneous agents, carcass quality.

Wild birds and vermin

- Screening of reservoirs for disease threats, e.g. avian influenza, Mycoplasma spp., Salmonella spp.

Communication

- Awareness of disease challenges in rearing stock.
- Early warning of disease challenges in other farms in an area.
- National and international communication on disease threats.

Once baselines are set for disease challenges and trends over time, together with good intelligence as to what major disease risks may be introduced into a particular area, then the veterinary health plan can start to lay down guidance as to what is needed as an effective biosecurity programme. This must be laid down in a logical manner, with aims and objectives produced that are on the one hand effective, but are also able to be achieved under practical conditions.

Components of a biosecurity programme

The components of a biosecurity programme can be split into three broad areas. These are:

Procedural biosecurity

This is where the concepts are outlined into an overall strategy of what is trying to be achieved. This may be a multi-layered programme such that there is an overarching general disease control programme, to which may be added specific HACCP type programmes for specific diseases or problems. A good example of one of these specific aspects might be a Campylobacter reduction programme. The procedural concepts should outline the strategy and the decision making procedure and, importantly, identify who within the organization has responsibility for the procedures, their implementation and their audit.

Physical biosecurity

This is the main foundation for the programme. It should consider the structural requirements, farm layouts, specific cation for all equipment and facilities onfarm (e.g. barrier hygiene, showers, provision of wheel and equipment sprays, foot dips, structuralhouse design and layout, etc.)

Operational biosecurity

This is where all the procedures are put into practice. The procedural programme should clearly identify personnel responsible for all areas of the operational programme, including production of appropriate paperwork and work recording systems such that it is possible to audit whether what is laid down is actually taking place in practice. Again, there is the requirement for this audit to feedback constantly into the procedural biosecurity strategy.

Procedural biosecurity

Although procedural biosecurity should be based on practical common-sense procedures, the use of HACCP principles offers the ability to review all risks and critical control points at the farm and company level and acts as a framework on which to build effective control strategies. Such a system can be developed for small or large sites, or companies operating multiple sites. The complexity of any HACCP system will reflect the risks identified. For disease control, critical controlpoints (CCPs) are the areas or weak points where pathogens may enter the system. Once identified, then procedures can be put in place to reduce or eliminate the hazard posed by these weakpoints. Hazard analysis is the starting point and can be aimed at general pathogen reduction or at specific threats such as avian influenza, Gumboro disease or Campylobacter. The CCPs can then be listed. Examples of the most significant examples for most pathogens are as follows:

- Personnel
- Other poultry
- Vehicles
- Equipment
- Feed
- Litter
- Water
- Vermin
- Insects/beetles
- Wild birds
- Residual site contamination.

Once these have been identified the next stage is to set limits to which the hazard must be reduced. For examples such as avian influenza the target might be total elimination or avoidance, whereas for organisms such as Campylobacter targets might be set for reduction in incidence over certain time frames. In assessing whether targets for critical limits have been met there must be effective monitoring of incidence of the organisms under scrutiny over time. On the basis of this monitoring the causes of any noncompliance or failure to achieve targets should be identified and corrective actions put in place. Records must be kept of this HACCP programme with ongoing verification and feedback of success or failure, such that targeted progres scan be made. The further aspect of physical biosecurity is aimed at reducing the existence or impact of CCPs, while operational biosecurity procedures should outline the practical and operationalsteps taken to address known CCPs.

ROSS HYDROXSIL

In general, offices, educational institutes, healthcare sector can be incubators for germs because not only is everyone in a contained space, but also common areas are used regularly. Imagine how many people are touching the knobs of the cubicles, meeting rooms, restrooms, classrooms, desks, furniture on a daily basis. For this reason, disinfection of these surfaces is critical to general health.

It's important to match your cleaning and disinfecting activities to the types of germs you want to remove or kill. Many viruses can live and potentially infect a person for only 2 to 8 hours after being deposited on a surface. Therefore, it is not necessary to vacate the place to clean or disinfect every surface in the building. The cleaning & disinfection can be done parallel with the regular operations as well.

A good all-purpose specialty disinfectant is a secret weapon in your cleaning arsenal. Not only are they safe to use on a wide variety of surfaces, but kills bacteria without leaving any residues.

Hydrogen Peroxide has always been one of the most commonly used disinfectants worldwide. In the past decade, it has become a growing favorite for commercial cleaning businesses. Ross Hydroxsil is a Hydrogen Peroxide with Silver Nitrate based multi-surface Disinfectant. This blend proves itself as a potent and overly powerful biocide that is effective on a broad spectrum with an extensive variety of applications. The silver in hydrogen peroxide acts on the DNA, while the hydrogen peroxide is destructive on the microbial cell walls, making this hydrogen peroxide with silver work on a double stage. Therefore it is effectiveness against all sorts of gram positive bacteria, fungi, yeast, spores, viruses and bio films.

POLYMERS IN WASTE WATER TREATMENT

Industrialization played an important role in the economy of any country. A lot of water is used for industrial purposes, so a lot of wastewater generated from industries due to their processes and washing purpose. Different types of chemicals hazardous as well as nonhazardous are used for the production of potable water and in the treatment of wastewater effluents.

Over the past few years, a lot of research in polymer composites were done in order to improve environmental protection and to present advantages for commercial applications of water treatment. Polymers offered tunable properties, improved processability, remarkable stability, a high surface area for fast decontamination, selectivity to eliminate different pollutants, and cost-cutting of water treatment. Therefore, the development of polymeric materials is one of the future directions to meet the environmental water standards and to supply the water requirements of the growing populations.

A polymer is a large molecule built up by the repetition of small, simple chemical units. In some cases, the repetition is linear, much as a chain is built up from its links. In other cases, the chains are branched or interconnected to form three dimensional networks. The repeat unit of the polymer is usually equivalent or nearly equivalent to the monomer, or starting material from which the polymer is formed.

Some of the possible applications of the polymer are as follows:

- Effluent water clarification
- Sludge dewatering
- Oil reclamation
- Air flotation
- Air scrubbers in steel, aluminum and other industries
- Wastewater clarification
- Metal plating waste thickening
- Juice clarification
- Dye removal

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TEAM

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