**INTRODUCTION**

The selection of a suitable yeast is very important for any distillery. Traditionally,

little thought was given to this selection, and a locally sourced spent brewing yeast

would be used for whisky fermentations. The yeast was usually available in the vicinity

of the distillery and was inexpensive and convenient to obtain and use. However,

more specialised distilling yeasts that have a better tolerance to ethanol and a wider

substrate range have become more popular over the years as a replacement for the

spent brewing yeast and are sometimes (not often) blended with the brewing yeast

(Stewart et al., 2013). Pure culture distilling yeasts are now commercially available.

Many have an additional genetic composition allowing them to ferment larger sugar

molecules such as maltotetraose (G4) and smaller dextrin molecules (G5 and larger),

and they also have the ability to better withstand fermentation stresses (details later).

Important yeast characteristics for the distiller include the following: alcohol production,

osmotic pressure, sugar, temperature and pH tolerance, appropriate flocculation

characteristics and enhanced viability and vitality during storage prior to pitching.

Also, the fermentation velocity of the strain, its fermentation lag period when

first pitched, and the correct formation of congeners (metabolites), for the particular

distilled product (Stewart and Russell, 2009) are all key characteristics.

Scotch and other whisky producers (unlike brewers) do not recycle their yeast, and

the regulations also do not permit the addition of nutrients such as yeast foods or enzymes

to the mash or the fermentation, which makes the selection of the correct yeast strain for

the appropriate substrates even more important. However, there are different regulations

for neutral spirit production, where these additions are allowed. Final ethanol

yields of over 90% theoretical conversion efficiency are the goal.

The primary yeast can be propagated in the distillery from its own starter culture or

supplied by a commercial yeast manufacturing company in a number of forms such

as dry yeast, wet cake yeast, or as a stabilised liquid yeast. These yeasts have the

following composition: dried (∼95% dry weight), compressed (∼26% dry weight),

or creamed (∼18% dry weight). The yeast has typically been propagated aerobically.

A secondary yeast (traditionally spent brewer’s ale yeast) can be blended for additional

flavour and, in some cases, this addition results in a final higher ethanol yield.

There are a number of suppliers of high-quality distilling yeasts, and the use of

spent brewer’s yeast has been phased out due to issues of supply and quality and

problems with maintaining a consistent flavour profile with the varying quality of the

yeast inoculum. Consistency of flavour associated with the particular product is an

important factor as the flavour of the spirit can be affected by which yeast is selected.

This latter yeast property is not fully appreciated (Noguchi et al., 2008). For many

years, it was thought that the only function of a distilling yeast was the formation of

ethanol, but this is not the case!

Distillers have standard microbiological