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عنوان مقاله:

ADVANCEMENTS IN TRANSGENIC TECHNOLOGY BRING AGRICULTURAL APPLICATIONS BACK INTO THE FOCUS

محل انتشار:

اولین کنفرانس بین المللی ایده های نو در کشاورزی (سال: 1392)

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خلاصه مقاله:

Humans have a long history in shaping the genetic makeup of livestock for improved production characteristics to meet crucial human demands for food and animal fibres. Until recently, this has been exclusively achieved through traditional breeding and selection schemes. Progress with this improvement strategy is however painstakingly slow. The modification of the genome is based on the generation of novel allelic combinations through recombination events during sexual reproduction that reshuffle the genome and the occurrence of spontaneous mutations. Due to the random nature of these changes, they can have both desirable and undesirable effects (that may also be linked) on the resulting phenotype. Strong selection for desirable trait characteristics can identify animals with the best phenotypes but overall, possible genetic improvements are restricted to only incremental gains. The true potency of the strategy only reveals itself over an extended period of time when large numbers of small gains have the ability to accumulate into substantial improvements.Although this approach has been very successfully applied in the past, the achievements were realised on the back of relatively stable conditions that are compatible with such a slow but steady approach. Predictions of a rapidly growing human population combined with extensive changes of the world climate over a relative short time period herald a fast approaching departure from these stable conditions. In the face of these pressing global challenges, faster and more flexible strategies will be required to adapt current livestock for farming under more extreme climate conditions, shrinking land resources and the increased food demands of a larger population. Genetic modification (GM) technology offers the potential for a more targeted approach to enhance specific characteristics at unprecedented magnitudes and the ability to achieve the improvements within a single generation. Rather than having to rely on good fortune for the production of new, more favourable combinations of the entire gene pool within the genome, GM technology can introduce specific changes at the single gene level. Moreover, the technology is not restricted by the gene pool available in a given livestock population but can utilise genes from otherwise inaccessible populations and even other species to introduce entirely new and unique characteristics.

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